CHALLENGES ENCOUNTERED BY NATED INFORMATION SYSTEM STUDENTS AT MAJUBA TVET COLLEGE, NEWCASTLE.

by

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DECLARATION

University of South Africa (UNISA)

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I, *Goodwill Phezulu Mbambo* declare that "Challenges Encountered by NATED Information System Students at Majuba TVET College, Newcastle" is my own original work and all sources used in this study are acknowledged as per my knowledge. The research output is my effort through the professional guidance of the recognised supervisor and CEDU team from University of South Africa (UNISA).

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DEDICATION

This dissertation is dedicated to my wife Philile Lethokuhle Mbambo, my two lovely and precious daughters ZamaChiliza S'nokuhle and Nonkazimulo Kwandokuhle.

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ABSTRACT

A large number of students are struggling with Information System and other computer related subjects. This has a negative impact on students' academic performance at large. In fact, a number of students from various institutions of higher learning are facing serious Information System challenges.

Information System student on NATED curriculum at Majuba TVET College are facing serious challenges on their studies. This has been indicated by their performance on Information System.

This article intends to draw an attention of education stakeholders, College management and lecturers to this matter. A number of reasons leading to students poor performance in this field has been mentioned. Various studies have been conducted but yet the lack of Information System skills still persists. The main question that guided this study was: *What are the stakeholders' perceptions of the challenges encountered Information System students?*

In order to explore and to get some findings for this case qualitative study, semi-structured interviews with relevant stakeholders were conducted. Sample of lecturers, student's focus groups and college management members was conducted. Data collected from various participants were transcribed verbatim. A combination of literature and data collected produced some findings on the matter. In an attempt to answer the main question, recommendations were made.

CHAPTER ONE

Overview of the study

1.1 INTRODUCTION AND BACKGROUND TO THE STUDY

A large number of National Accredited Technical Education Diploma (NATED) students doing Computer subjects at Majuba Technical Vocational Education and Training College (TVET) in Newcastle, KwaZulu-Natal are struggling with their studies. These subjects they are struggling with include Computer Practice (CP), Information Processing (IP), Computerised Financial System (CFS), Introductory to Computer Practice (ICP) and Office Data Processing (ODP). This study is intended to address this problem and to explore possible solutions in order to develop required computer skills and knowledge among college students.

The curriculum for TVET sector is divided into two, namely National Accredited Technical Education Diploma (NATED) and National Certificate Vocational (NCV). NATED curriculum or programme is for those students who completed their matric, most of them from basic education (DoE) and they are doing their tertiary studies at the college and those who completed their NCV level four. National Certificate Vocational (NCV) curriculum if for students who are doing National Qualification Framework (NQF) level two to NQF level four which is equivalent to what students from basic education are doing. NCV comprises three academic levels namely, Level one to level three. NQF Level two is equivalent to Grade 10, NQF level three is equivalent to Grade 11 and NQF level four is equivalent to Grade 12.

Through this study Information System results are to be improved. Information system skills can be improved. Students registering these subjects would be increased. Lecturer's duty might be simplified. This study will attempt to develop long term computing skills among college student which will make them responsible citizen who will contribute positively to the economy of the country.

The College usually enrols two types of first year students for NATED curriculum, those coming from basic education with National Senior Certificate and those coming from TVET with National Certificate Vocational (NCV). First year students, most of them coming from Grade 12 tend to be the real victims of this situation. What is the

main course of this? Does this has something to do with lack of computer skills from basic education or is because our students are technologically disempowered? What background do they possess in connection with Information System?

Nowadays one cannot divorce Information and Communications Technology (ICT) from education. Majuba College or our education system must produce ICT literate individuals who will contribute positively to our economy as a country. The college has a high student's enrolment; most of them are blacks with poor educational background from poorly resourced schools. These students seem to face serious challenges with computer skills or subjects related to computers.

As illustrated (White Paper for Post School Education & Training 2013:12) the main purpose of TVET Colleges is to train young school leavers, providing them with the skills, knowledge and attitudes necessary for employment in the labour market. They primarily provide training for the mid-level skills required to develop the South African economy, and tend to concentrate on occupations in the engineering and construction industries, tourism and hospitality, and general business and management studies. It is the researcher's belief that computer skills cannot be separated from other skills mentioned above. It is so unfortunate that our students are really struggling with computer skills.

Challenges associated with students' failure to cope with new technology must be eliminated. As indicated above, most of students struggling with computer skills are those who are coming from Grade 12 and they are doing their first year at the College. Does this have something to do with the department of basic education or even educator training, or is a fear of the new environment at tertiary institution. Do educators/lecturers have something to do with student's performance? One explanation offered for teacher's low self-efficiency is insufficient exposure to ICT in their teachers training programmes (Kumar & Vigil, 2011).

This study will focus on student's challenges in connection with their computer subjects, trying to find out why they are struggling with Information System at large. Through literatures and consultation with relevant participants, the researcher will ascertain that the solution is reached and students' performance in the field of ICT/

Information System is improved. The researcher believes that if computer subjects problem is resolved that might improve their academic performance at large.

TVET Colleges were administered by College councils in the past. In the year 2015 all 50 TVET colleges nationwide were absorbed by the Department of Higher education and Training (DHET) under Dr Blade Nzimande as a minister. TVET colleges use to absorb number students who completed their matric and those who did not under the National Certificate Vocational (NCV) to acquire various skills and knowledge. It is stated on the White paper that the DHET highest priority is to strengthen and expand the public TVET Colleges and turn them into attractive institutions of choice for school leavers. Students enrolment increased from 345 000 in 2010 to 650 000 in 2013.

1.2   RATIONALE FOR THE STUDY

NATED student's poor performance in Information System (IS) at Majuba TVET College was the main reason that led the researcher to conduct such a study. This study was intended to identify challenges which led to student poor performance on computer subjects/ Information System. These subjects include Computer Practice (CP), Information Processing (IP), Computerised Financial System (CFS) and Office Data Processing (ODP).To improve the usage of computers and to get good results in Information System was the reason of conducting this study.

It is a fact that Information System plays a significant role in our education, workforce, in our economy and our daily lives today. Because of this, computers are greatest part of this technology. This is the reasons why the lack of computer skills, among college students needs to be addressed. This lack of computer skills is indicated by their poor performance on their computer subjects.

Our education system should produce ICT literate citizen who can access required information, solve educational and economic problems and come up with new strategies to our education system by using computer/ICT skills. It was up to this study to ascertain that educators/ lecturers are instrumental as to let their students see the importance of computers in education system and help them with skills development that will improve students' performance in their computer subjects.

1.3 STATEMENT OF THE PROBLEM

Information System student on NATED curriculum at Majuba TVET College are facing serious challenges on their studies, especially those who are doing their first year at the college. This has been indicated by their performance on Information System.

1.3.1   The main research question

What are the stakeholders' perceptions of the challenges encountered by NATED Information System students at Majuba TVET College?

1.3.2   Subsidiary questions

- What are the challenges experienced by the NATED Information System students?
- What are perceptions of the NATED Information System lecturers of the challenges encountered by students?
- What are perceptions of the college management of the challenges encountered by NATED students in Information System?
- What can be done to eliminate the challenges faced by the students?

1.3.3   Purpose, aim and objectives of the study

The aim was to find out what were the stakeholders' perceptions of the challenges encountered by NATED Information System students at Majuba TVET College.

The following were the objectives of this study:

- To identify the challenges experienced by the NATED Information System students.
- To assess the perceptions of the NATED Information System lecturers of the challenges encountered by students.
- To assess the perceptions of the college management of the challenges encountered by students towards Information System.
- To explore strategies that can be implemented to eliminate the challenges faced by NATED Information System students.

1.4 THEORETICAL FRAMEWORK

This is a collection of interrelated concepts, like a theory but not necessarily so well worked-out. In this study a "*Diffusion of innovation*" theory will be followed. Diffusion of innovation is defined as a theory that seeks to explain how, why and at what rate new ideas and technology spread. Rogers (2003) argues that diffusion is the process by which an innovation is communicated over time among participants. The reason of incorporating this theory in this study it's because tertiary institutions students in particular are anticipated to come up with new ideas in Information System, adopt and let others adopt these ideas.

On the other hands, Hargreaves (2004) proposed that "learning to do things differently in order to do them better". A general definition of the term innovation is the introduction of something new that is intended to be useful (Whitehurst, 2009). Rogers's diffusion of innovation is categorised in three main types which are continuous innovation, dynamically continuous innovation and discontinuous. For the purpose this study a continuous innovation will be adopted as it relates to Information System implementation. College student are expected to adopt this theory in order to better their Information System performance and their education at large.

1.5 RESEARCH METHODOLOGY AND DESIGN

Qualitative methodology was used in this study. Qualitative research method was followed in order to explore and describe the challenges or problems encountered by Information System students at Majuba TVET College. The researcher was of an idea that this methodology was able to identify the challenges faced by students in Information System. Through this methodology, NATED students' challenges in Information System were identified.

In qualitative research, the researcher is actively involved and attempts to understand and explain social phenomena in order to solve what Mason (2002: 18) calls the "intellectual puzzle". Qualitative research may achieve depth and breadth (Blaxter et al, 1996) on the other hand, (Mason,2002) states that it is the most appropriate

approach for studying wide range of social dimensions, while maintaining contractual focus.

Information System lecturers and management team from Majuba TVET College were the participant in this study. The method, qualitative was also used to allow participation of people who were directly involved to the problem, the students. The findings of this study could also help the very same participants to improve computer subjects' results or their performance at the College.

1.5.1   Research approach

According to Maree (2012) "qualitative research methodology is concerned with understanding the processes and the social and cultural contexts which underline various behavioural patterns…" this study followed a qualitative research approach in order to explore the factors that contribute negatively on students' performance and attempt to come up with possible solutions.

Qualitative research as a research methodology is concerned with understanding the processes and the social cultural contexts which underlie various behavioural patterns and is mostly concerned with exploring the 'why' questions of research (Kobus, 2010). This research method was followed in order to explore and describe the challenges or problems faced by Information System students at Majuba TVET College.

Schumacher (2010:321) pointed out that qualitative research allows the observing of behaviour as it occurs naturally and there is no control of behaviour or settings and there is no internally imposed constrains.

1.5.2   Population and sampling

Purposive sampling was suitable for this study. The population and sample providing data was targeted on certain Majuba TVET College lecturers offering Information System at three different campuses whereby Information Technology and Business (ITB), Centre for People's Development (CPD) and Dundee campuses were the main focus. The reason for selecting participants from these campuses was due to the fact

that they can provide the required, relevant and more appropriate data regarding the challenges faced by students in Information System or computer subjects. In these campuses is where the researcher found a large number of students doing computer subjects and numerous lecturers offering these subjects as well. Focus group interviews with NATED Information System students also formed part of this study.

Ormrod (2005: 145) pointed out that purposive sampling involves the selection of individuals who are in a position to provide sufficient information on the topic being discussed. This sampling assisted the researcher to derive in-depth knowledge through interviews from relevant participants.

Selection of six Majuba TVET college lecturers offering Information System subjects have been done in semi-structured interviews. A Sample of six lecturers of Information System and ICT related subjects from the same institution was organised. Two lecturers per campus were interviewed. One HOD per campus and three campus managers were also interviewed, one manager per campus. Purposive sampling was utilised because the field of ICT does not need anyone but people who are knowledgeable and skilled. This is a selective or subjective kind of sampling. Selection of participants who are familiar and possess relevant skills and experience was of cardinal importance. This is a kind of sampling require individuals with expertise. In many cases purposive sampling is used in order to access knowledgeable people', i.e. those who are in depth knowledge about particular issues (Cohen, et al., 2007)

In- depth interviews sampling table

Table 1.1 Sampling

PARTICIPANTS	NUMBER	TOTAL HOURS
Campus Managers	1 x 3 = **3**	1 ½ Hours
HOD's	1 x 3 = **3**	1 ½ Hours
Lecturers	2 x 3 = **6**	3 Hours
Students (Focus groups)	3 x (8 students per group)	3 Hours

1.5.3 Instrumentation and data collection techniques

Creswell (2009) stated the most common sources of data collection in qualitative research are interviews, observation and review of documents. Semi-structured interviews with lecturers and management members were conducted and focus groups with students were utilised as one of vital tools of collecting required and useful data. This tool (focus group interviews) was convenient because the researcher can collect a large volume of data in a very short time. In-depth individual interviews among Information System lecturers were conducted in a way that it collects information based on lectures knowledge, experiences, expertise and contribution to this field. Participants managed to provide data freely knowing that only the researcher will have access on it.

The distinctive feature of observation as a research process is that it offers an investigator the opportunity to gather "live" data from naturally occurring social situations (Cohen, et al., 2007). He also state that in this way the researcher can look directly at what is taking place *in situ* rather than relying on second hand account. Robson (2002: 310) says, what people do may differ from what they say they do, and observation provides a reality check. An interview allows the researcher to get data from the horse's mouth and can be recorded for replay.

 Semi-structured interviews with some college lecturers and college management team were organised. The reason of including lecturer's participation was that they were the ones who are directly involved to the situation. The Interview is undoubtedly the most common source of data in qualitative studies (Thomas, et al., 2010). Data was also collected from senior college management. The researcher's reason to collect data from college senior management was that the management use to keep the records for entire college results statistics including that of Information System.

Consultation with other academics and other education stakeholders inter alia lectures, Information and Communications Technology (ICT) expect and college management were made. Sources like internet was also used as a system of

collecting required data from various and relevant websites. Semi-structured interviews and telephone conversation with relevant participants inter alia Dundee campus lecturers which are few kilometres away from Newcastle but forms part of Majuba College was also organised. Articles published in the journals, websites and textbooks were consulted. Qualitative data is obtained through semi-structured interviews during college campuses visits.

1.6   Data analysis and interpretation

The recorded semi-semi-structured interviews were transcribed verbatim and these was organised into categories and themes. A recording tablet was used to capture/record an interview and the recordings were analysed. Researcher also complimented the interviews with notes written during the data collections procedures. Follow up questions were added as per necessity during the process.

1.7 CREDIBILITY AND TRUSTWORTHINESS

Salkind (2006) refers to dependable, consistent, stable, trustworthy, predictable and faithful as synonyms for reliability. Reliability occurs when an instrument measures the same thing more than once and results in the same outcomes. On the other hand (Durrheim & Wassenaar, 2002) refer to credibility as the assurance that the researcher's conclusions stem from the data.

Credibility is involved in establishing that the results of the research are believable. This is classic example of 'quality not quantity'. According to anonymous writer "it depends more on the richness of the information gathered, rather than amount of data gathered".

The usage of interviewing various participants from various campuses of Majuba TVET College will prove the trustworthiness of data collected. Laurie (1995: 27) suggest that computer aided methods can enhance validity and reliability (by retrieving all the data on a given topic, thereby ensuring trustworthiness of the data).

1.8   RESEARCH ETHICS/ ETHICAL CONSIDERATIONS

For the purpose of this study, ethical clearance was given by Majuba TVET College management, Department of higher education (DHET) and the University of South Africa (UNISA) to conduct the research in this field. According to Leedy and Ormrod (2001), "the researcher should ensure that participants are not exposed to any undue physical or psychological harm." The researcher ascertained that this is taken care of.

Before the interviewing process the researcher presented the participants with the consent letters which describe the research process. The participants were also notified verbally that they are free to withdraw at their sooner convenient time if they are no longer comfortable with the process. This gave them freedom to provide as much data as they wished. Participants were also assured of anonymity and confidentiality.

1.9 LIMITATIONS OF THE STUDY

Limited or lack of knowledge among other participants themselves became a hindering factor in this study. Other limiting factors were the issues of time and lack of confidence. This study was conducted in a very specified and limited time frame. This had a negative impact on the outcomes/ findings of the study. Time was too limited while data had to be collected from a number of participants and from various Majuba TVET campuses. Lack of confidence among participants regarding Information System knowledge and skills became another hindering factor.

Limited number of recent studies conducted under this field was another challenge to this study. Most of studies related to this were outdated as most of them were 10 or even 15 years old. Providing evidence from recent literature was a challenge. Available literatures look at barriers and uses of ICT, with some emphasis on the use of computers (Scrimshaw, 2004). Only one college, the focus was on one college, Majuba out of 50 TVET colleges in the country.

1.10 DEFINITION OF KEY CONCEPTS

ICT	Information and Communications Technology.
ICT Defined as	Forms of technology that are used to transmit process, store, create, display share or exchange information by electronic means. UNESCO (2002, p.10).
Information System	Combination of people, hardware, software, communication devices, network and data resources that process data and information for a specific purpose.
ICT literate	The ability of individuals to use ICT appropriately to access, manage, evaluate information, develop new understanding, and communicate with others to participate effectively in society.
Curriculum	Refers to the lessons and academic content taught in a school or in a specific course or programme. (http://edglossary.org/hidden-curriculum)
Technology	Collection of techniques, skills, methods and processes used in the production of goods or services or in the accomplishment of objectives, such as scientific investigation.
Database	Collection of information that is organised so that it can easily be accessed managed and updated.
Software	An electronic instruction that tells the computer what to do/computer programmes.
Hardware	Physical parts of the computer,
Peripherals	Device that is used to put information into or get information out of a computer.
Hard copy	A printed document in a form of a paper.
Computer literacy	Capability to use computer basic skills.
BECTA	British Education Communication and Technology Agency
ICP	Introduction to Computer Practice
IP	Information Processing
CFS	Computerised Financial System

1.11   CHAPTER OUTLINE

This study comprise of five chapters with relevant topics and subtopics.

Chapter 1: This chapter provides the background of the study, as well as the rationale behind the research, the problem statement, the aims and objectives, and the scope of the research.

Chapter 2: An extensive review of the existing literature, concerning challenges/ barriers, facing students in respect of computer subject performance was set set out in this chapter.

Chapter 3: This chapter incorporated the research design and methodology of this study.

Chapter 4: Results were analysed and the findings discussed at the later stage in this chapter.

Chapter 5: Conclusions and recommendations of the study were set in this chapter.

1.12 SUMMARY

In this study the researcher attempted to get solutions that might improve Majuba TVET students' performance in computer subjects/information System. This might reduce both failure rate and fear of computers. Through this accomplishment, accessing information among student should be encouraged not only the one based on computers but for their education as required.

The findings of this study were anticipated to be an eye opener to Majuba TVET College management and lectures or might bring solution to the problem being experienced by their students. Students' performance in Information System might be improved as a result of this study. Certain measures which will be the results of this study might be utilised by College management to improve the entire student results. In other words this study should set out a vision to Majuba TVET college management and lectures offering Information System.

This study became an eye opener, not merely to other people but also to the researcher himself and other stakeholders. Actually there is a large outcry in South Africa based on students not doing well on computer subjects. Educators/ lecturers need to be instrumental in this field. They must possess required computing skills and knowledge as a way of setting good trend for their students. It is a limitation also to involve lecturers as participants, teaching computer subjects while it is not their field of specialisation, some without even teaching methods/qualification.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Previous studies have identified numerous factors that affect students' academic performance in various fields. In this study the focus will be on Information System student's poor performance mainly at Majuba TVET College. This literature review will re-examine some of the factors that have been evaluated. MacMillan and Schumacher (2010:73) state that literature review is done to establish the important links between existing knowledge and the research problem being investigated, which enhances significance and provides helpful information about methodology that can be incorporated into a new study. According to Taylor (2012:44) literature review is an account of what has been published on a topic by accredited scholars and researchers. On the other hand, Denscombe (2002:54) stated that "newly published works need to be considered; new sources are discovered; different things became relevant as the research progresses" This study explored various studies knowing that not all studies conducted came up with solutions but some are eye openers to a certain specific problem.

Devices being used in Information System in education include computers, tablets, smartphones, data projectors, personal digital assistants (PDA's), alarm systems, air conditioners, radios, television sets, microwaves, permanent and removable storage devices, cell phones, radios and so on, as well as various applications associated with them, such as video conferencing for distance learning (Rouse, 2008). Rapid and continuing advances in Information System are changing the way people share, use, develop and process information and technology (Meiers, 2009). Meiers (2009) also stated that in this digital age, young people need to be highly skilled in the use of ICT and there is a growing body of evidence that use of ICT in the classroom can enhance learning. Information System also focuses on techniques like internet, Global positioning Systems(GPS), Bluetooth or other wireless communications, firewalls, Local and international networks. These techniques are used in education, financial institutions, and various types of businesses, on roads and even on households. An extensive review of the existing literature, concerning challenges

facing students in respect of Information System or subject performance has been set out in this chapter.

2.2 Information System

Information System is defined as a combination of people, hardware, software, communication devices, network and data resources that process data and information for a specific purpose (Smith, et al., 2013). UNESCO (2002, p. 10) defines ICT as "forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means." This definition covers such technologies as radio, television, videotape, audiotape, tape recorder, compact disc (CD), digital versatile disc (DVD), flash drive, telephone (both fixed line and mobile), satellite systems and computer hardware, software and networks. It covers also services associated with these devices, such as video-conferencing, email and blog. The concepts Information and Communications Technology (ICT), Information Technology (IT), Computer Science, modern technology cannot be separated from Information System.

Techniques like internet, Bluetooth, firewall, programmes, viruses, and many more forms part of Information System. It also includes devices like computers, printers, smartphones, tablets, scanners, bar code readers, Personal Digital Assistant (PDA), storages, and many more devices. The main purpose of Information System is to input, process, and stores data/information and to gives a processed output. Information system nowadays is used in schools, universities, colleges, hospitals, on roads, police stations, businesses and in households.

Zwass (2016) defines Information System as an integrated set of components for collecting, storing, processing data and for providing information, knowledge, and digital products. Smith made mention of people on his definition of Information System while Zwass did not. People are the most important element of Information System. Without people Information System is impossible. Concepts like processing, data, hardware and software forms part of any definition of Information System. On other hand, hardware and software are regarded as the main components of

Information System. A combination of these two makes up a computer system to operate. Neither hardware nor software can function on isolation.

Information System needs people who possess specific knowledge of using this techniques and devices (Doyle, 2016). In other words people need to be computer literate in order to use this modern technology. Computer literate person is the one who has knowledge and ability to use computers and technology efficiently. According to Reynolds (2007), computer literacy means being knowledgeable about the capabilities of hardware and software and understanding how computers and the internet can enhance student's educational experiences. Employers on private and public sector use to state clearly that a computer literate person is required to be considered for various types of employment nowadays. Pen and paper use seem to be less important today because of computers or modern technology. Computers and other related devices are now considered to be the best way of communication which is fast and cheap. Each and every student from school, college or university needs Information System skills.

This study emanated from the problem of Majuba TVET College students who seem to lack these skills as indicated by their assessment performance. Many first year Information System students show inadequate knowledge of the fundamental principles of ICT. Many studies have been conducted indicated that this is a common problem to all countries of the world but is worse in developing countries (Bingimlas, 2009). The problem of ICT skills shortage among College and university students emanates from the fact that schools have inadequate resources (Marais, 2009). This also includes human resource.

According to Lawrence and Veena (2013), ICT specific fundamental skills include basic action such as: managing electronic files, using computerised databases and spreadsheets, sending and receiving e-mail messages, and creating documents with graphics. In the study conducted by Ntemane (2012), it was stated that despite its poor ICT infrastructure and high level of poverty, Lesotho has begun to take the necessary steps toward promoting higher levels of ICT access and usage in its communities and educational institutions. The government of Lesotho has adopted a

National ICT policy that makes some references to the education sector (Ntemane, 2012).

"The introduction of ICTs to our schools is creating new ways for students and teachers to engage in information selection, gathering, sorting and analysis. In addition, ICTs have the potential to enhance the management and administrative capacity of schools. This White Paper sets out Government's response to a new Information and Communication Technology environment in education"

Pandor, (2004)

The former national minister of Education, Naledi Pandor issued an above statement in 1994, but till today South African schools still lack ICT infrastructure.

2.3 Environmental background

It has been evident that classes with a huge number of students do not do well on assessments. This seems to be common to Information System classes where a lecturer need to move around the class assisting each student. One prominent variable in the environment and physical investment is class size. A better higher education environment is correlated with small classrooms. Angrist and Lavy (2004) conducted an experiment to test the class size and student performance. On the other hand, Hanusek (2003) had already shown that one cannot conclude, without some doubts, that the reduction in class size improves student performance. The issue of class sizes and time allocated could be other factors that have a negative impact on student poor performance on computer subjects (Stephens, 2007).

It is clear that educational change is a difficult and complex process" (Norton & Sprague, 2001) but none the less it is transformation that is necessary and requires the change-agent to be the educator, on this case a lecturer. On the other hand Wheeler (2010) said it is exciting and in some cases daunting experience. Computers seem to be new in most of our schools in South Africa, particularly to the previously disadvantage black schools. As a result, certain principals look at the subjects as a monster which will put pressure to them and consume the entire school budget. This notion will always put students behind. They will always find Information System challenging as they are to start using computers at tertiary institutions.

Within South Africa we have initiatives such as Gauteng Online Labs (Isaacs, 2007) and the Khanya Project (Isaacs, 2007) that aim to support educators in their pursuit of using ICT in their classroom in order to deliver curriculum by decentralising power in the classroom (Mioduser, Nachmias, Tubin & Forkosh-Baruch, 2003). Educators and lecturers must be instrumental and ascertain that they utilise such initiatives to help themselves and their students.

An idea of student tablet and teacher tablet introduced by the minister of education in Gauteng, Mr. Lusufi is highly commended. The use of electronic boards as oppose to chalkboard, with health risk is also encouraged. This is one way of encouraging the use of ICT in the education system of South Africa. It is one of the emerging recommendations of this study that other eight provinces in the country should follow a good initiative by minister Lusufi in Gauteng. A national "teacher laptop policy" which was envisaged must be put into practice as a way of upskilling educators. The DoE owe students and educators a real change. A change that will simplify both educators' and students work. A good example of changes in work practices is in schools in the United States that have introduced laptops for all students and have trained teachers to organize teaching around students' doing all their written assignments on their laptops. This system, introduced by Net Schools specifically changes teacher and student work, with the purpose of improving the academic performance of at risk students (Carnoy, 2004).

The shortcomings of the initiative introduced by minister Lusufi in Gauteng is that both educators and students were not given Information System skills. There was no sufficient training for educators prior to the introduction of this tablet initiative. Educators themselves are still facing challenge in as far as usage of these devices. Students also are being taught how to search for certain specific information online using google application. Basic and fundamental computing skills are not taught to students except to those schools where computer subjects like Computer Applications Technology (CAT) is part of the curriculum. Computer subjects need to be introduced and to be part of curriculum so that students will be able to develop all computing skills rather than getting to google and social networks only.

It was stated on the white paper (2004) that the introduction of ICTs to our schools is creating new ways for students and teachers to engage in information selection, gathering, sorting and analysis. In addition, ICTs have the potential to enhance the management and administrative capacity of schools. This White Paper sets out Government's response to a new information and communication technology environment in education. The former education minister, Naledi Pandor (2004) stated clearly that they want to ensure that every school has access to wide choice of diverse, high quality communication services which will benefit all learners and local communities. Based on Pandor's statement, it is explicit that Information System or ICT is the best way of spreading information and knowledge to students and educators or lectures. Computers are one of fast communication channels which make life easier.

Numerous studies have found that one of the main reasons for failure in first year, or high student dropout rates, is due to academic under preparedness (Makoni, 2010). First year Information System College students are underperforming sue to the lack of ICT resources from their own respective schools especially where they matriculated. The most prominent cause of this academic under preparedness is the inequalities of the past, and repercussions of the apartheid regime (Maher, 2011).

It is an unfortunate fact that before Information System becomes a challenge for students, language is a challenge on its own. New technology or Information System comes up with new concepts, all in English. Language is a barrier on its own to African Students. Due to "inequalities that still exist in the secondary school system" (Nagel, 2010), for example the importance that is placed on English or Afrikaans as the only medium of instruction, many students are not performing adequately in tertiary education. In spite of eleven official languages in South Africa, English and Afrikaans are still given a privilege over other African Languages. This does not affect student negatively on one or two subjects but to all subjects including that of Information System. Feast (2002) also identified the institution, such as university or school and its teaching methods, as a contributing factor. Poor or no proficiency in the language of instructions can contribute towards academic difficulties and successes (Butler & van Dyk, 2004). Many non-English speaking learners from disadvantaged or rural South African settings come from families where reading and writing is not "integral to their daily lives" (Bertram, 2006, p. 12).

2.4 Resource problems

In as far as the issue of resources is concern; focus of this study was on human resource and equipment. Previous studies revealed that in South Africa as a developing country there is a serious shortage of ICT educators and lecturers. This is a serious lack of human resource emanates not at tertiary institutions like Colleges and universities, but it emanates from basic education. Student with matric they lack computing basic skills, some cannot even type their assignments in Microsoft Word application let alone creating e-mail addresses for them.

It is an unfortunate reality in South Africa that past imbalances in the education system continue to perpetuate poorly resourced schools and inadequately skilled teachers particularly in the field of Mathematics and science (Ramose & Park, 2003). This situation seems to be common to other subjects particularly those related to computers or Information System. Actually all science and technology subjects are problematic to South African students on both Basic education and Higher education. Statement by Ramose revealed a problem that relates both human resources and lack of ICT equipment in our schools. This study was addressing both of these.

Resources can be a serious challenge limiting students to access ICT or to do better in education. This might not be a problem that starts from the College but it emanates from schools where student matriculated. Lack of electricity in rural schools seem to be another factor that hinder rural ICT (Jones, 2013) As stated by the researcher the issue of resources can go a long way and might results to College students accessing computers for the first time in their tertiary education.

One computer per student can be tested and be look upon it is not a resource problem in this scenario. Before conducting this study, the researcher identified the serious ICT resource shortage in some of the schools and colleges especially computers shortage. Students who have participated in 1:1 computing report higher achievement and increased engagement, according to findings of studies published in a special issue of the journal of Technology, Learning and Assessment, published by Boston College's Lynch School of Education.

It is clear that as this problem emanates from schools, students proceed to institutions of higher learning without computer skills or knowledge. Educators from basic education lack confidence in Information System. Several researchers indicated that one barrier/challenge that prevents teachers from using ICT in their teaching is a lack of confidence. Dawes (2001) sees this as contextual factor which can act as a barrier. On another research by Becta (2004), much of the research proposes that this is a major barrier to the uptake of ICT by teachers in the classroom. Beggs (2000) asserted that teachers "fear of failure" caused a lack of confidence. One cannot succeed if s/he lacks confidence. Most of teachers graduated for their teaching qualification without Information System skills or knowledge. Some teachers are reluctant to accept change to use modern technology in education. Balanskrat et al (2006) found that limitations in teachers ICT knowledge makes them feel anxious about using ICT in the classroom and thus not confident to use it in their teaching.

Not all schools lack hardware or software, certain schools lack human resources. The reason behind is based on serious shortage of educators in possession on of Information System skills. Some educators are lacking confidence on using such limited skills in classrooms. Pelgrum (2001) found that the most frequently mentioned problem when teachers were asked about obstacles to their use of ICT was the insufficient number of computers available to them. Guha (2000) found similar results, with many teachers surveyed indicating that the number of computers in their classrooms was insufficient, and that if teachers were to continue to implement ICT into their work then they require the appropriate hardware and software to familiarise themselves with first, then guide their students accordingly. Guha (2000) also reiterate that those educators using technology in their teaching always complain about a lack of equipment. Some educators complain about the fact that computers they are using get broken time to time. They are always experiencing hardware and software problems. They say it also time consuming to get these problems sorted.

In some of the schools computers are available but to get an Information System qualified educator is a challenge. Even those schools with educators possessing limited ICT skills are afraid to take an initiative. Some schools possess totally outdated resources. It is a challenge on its own to find a school using Microsoft Office

2003 in the year 2016. This is totally outdated software. Guha (2000) found that poorly designed software, and a lack of time for teachers to design their own software, often cause teachers to give up and choose not to make use of ICT. Bosley and Moon (2003) stated that inappropriate software is also identified as a challenge in the study conducted by Centre for Guidance Study. Some schools using dot-matrix printers, which is an outdated and unsuitable hardware for schools. Preston, C., Cox, M. & Cox, K (2000) found this to be a particular problem for teachers, who complained about out of date resources, and the fact that hardware became obsolete very quickly. The outdated resources are a total discouragement for educators as they kept on being interrupted by these resources. Some researchers stated that educators complain about lack of finances as this software is very expensive.

Compiling an ICT profile for South African schools presents a challenge. Statistics are influenced by various factors, including the rapid redundancy rate, the level of usage and the sharing of ICT resources (DoE White paper, p11). In a National survey of Information Communication Technology in South African schools, (Lundall & Howell, 2000) stated that "the principal factors that prevent schools from using computers as a tool for teaching and learning are: insufficient funds, an insufficient number of computers, lack of computer literacy among teachers, lack of subject teachers trained to integrate computers into different, learning areas, the absence of a properly developed curriculum for teaching computer skills".

Some of the South African Government initiatives to deal with ICT training for teachers include the nine centres being established in each of the provinces as part of the Vodacom Mobile Education Programme. This type of ICT education centre for teachers is the realisation of a partnership formed between Vodacom and the Department of Education in order to help boost teacher training across all nine provinces of South Africa (Ayemoba, 2013).

Large number of schools in South Africa still lack Information System resources. Some of schools do not have even a single personal computer (PC) for administration purposes, let alone a computer lab for students. "With computer capacity available to schools, it would not be difficult to assess student results against components of the

curriculum. In states or countries where students are tested in every grade, it would be possible to assess student progress grade by grade in each school provided that students stayed in a school" (Carnoy, 2004). In his inaugural lecture of "ICT in education: Possibilities and Challenges", Carnoy (2004) stated that good school administrators do use data to improve student performance, but there is very little evidence that ICT is widely used even in countries where schools have ample computer hardware and software to use available information in this way. With computer capacity available to schools, it would not be difficult to assess student results against components of the curriculum (Carnoy, 2004). The department of basic education in South Africa must see to it and ascertain that all school are computer equipped. The required resources including human resource should be made available.

Many countries (including developing countries such as South Africa) have increased the number of computers in schools in recent years or have plans (such as the Teacher Laptop Initiative in South Africa and Kenya) to increase teachers and learners access to computers Kargiban & Siraj, 2009:147). In his research, Mathevula (2014) noted that the Teacher Laptop Initiative (TLI) aims at improving Information and Communications Technology in teaching and learning and aims to ensure that more than 350 000 government school teachers in South Africa own and use laptops, by providing them with monthly allowance which will cover the purchase costs as well as the costs of connectivity. How many of these educators possess internet skills? How many of them manage to benefit from this initiative? According to Mathevula (2014) the initiative was launched in 2009 by the former minister of education, Naledi Pandor but seem to be unsuccessful because of funding problems and teachers who are blacklisted. The initiative was supposed to be completed the distribution of laptops to qualifying teachers by the end of 2011. (Tubbs, 2013)

In researcher's perspective, the idea of TLI was good. The problem was the number of school or number of teachers that will benefit. Some schools are in remote areas where internet connectivity is a challenge. Schools in those areas might not benefit. On the other hand crime rate is rife in the country. The minister was expected to come up with measures to keep these laptops and users safe. Mathevula (2014) continued saying even if the initiative was completed, there is no guarantee that most rural

schools will reap the benefits of these laptops because of lack of internet or prohibitive and exorbitant costs of internet for schools that have access to it or just because of teachers' lack of necessary skills to use them.

2.5 New Technology

According to Nagel (2013) there are challenges concerns with new technology in schools today. The researcher also stated that some include resistance to change and professional development. Students proceed to Colleges and universities from matric with little or no knowledge or skills of computers. This seemed to be a serious challenge and is also questionable because the very same students use modern technology as they are in a possession of smart phones and tablets. Do these students know how to use these devices?

Technophobia can be caused due to general anxiety or fear about science or mathematical problems. People often feel intimidated by these subjects and are hence likelier to show computer anxiety (Jacobs, 2013). As stated above, most have a fear of certain subjects like Mathematics and Physical Science which is possible that they extend this phobia to computers. Knowledge is the best way of overcoming this fear. Individuals suffering from this phobia must be willing to share ideas, information and knowledge by first admitting to their phobia (Salmon, 2015). In the study conducted by (Wilson, 2006) students show lack of computer skills. Wilson (2006) continues stating the education testing service is conducting studies that could reveal lack of "information literacy" among college and high school students.

In some of the schools there are computers to be used by educators, but they don't as they are opposing or afraid of new technology. Relevant software of processing students' marks in a professional way like "Spreadsheet" is available. In spite of the availability of such software, educators prefer to use a traditional system of processing marks one by one using calculators. The DoE owe students and educators a real change. A change that will simplify both educators' and students work. A good example of changes in work practices is in schools in the United States that have introduced laptops for all students and have trained teachers to organize teaching around students' doing all their written assignments on their laptops. This

system, introduced by Net Schools specifically changes teacher and student work, with the purpose of improving the academic performance of at risk students (Carnoy, 2004).

2.6 Skills Development

TVET plays an essential role in helping reduce poverty and promote growth as well as in ensuring the social and economic inclusion of marginalised communities. Many governments are not giving sufficient priority to the basic skills and learning needs of youth and adults. Quality TVET programmes are urgently needed to bridge the gap between school and work (UNESCO, 2011). Basic computer skills need to be developed starting from basic education. This might help college students to easily acquire more advance skills in computing which will improve their academic performance and quality of education might be improved. UNESCO promotes TVET skills for work as part of lifelong learning… (UNESCO, 2011)

Problems like Information Technology (IT) skills shortages and youth unemployment could be addressed by encouraging more girls to consider careers in IT (O'Grady, 2016). This shortage of skills seems to be a serious problem in our colleges. Improvement of computer skills among college students can also fight an unemployment problem which seems to consume our country, South Africa. According to (Rushton, 2016) there is an increase to ICT workers in 2014. The report continues stating that Australia needs a workforce that is equipped with the ICT skills necessary to fuel its digitally-driven economic growth.

Majuba TVET College is also anticipated to ascertain that students acquire the required computer knowledge, skills and expertise. The same computer skills acquired by students are needed by country's dropping economy. Through computer skills economy can be improved, unemployment rate can also be reduced; students' academic performance can be improved. The main aim of introducing TVET Colleges was to address the skills shortages within the country as depicted within the government strategies, Accelerated and shared growth strategy of South Africa (DoE, 2006:5). To this end, the two government departments (DoE and DHET) were

involved in separate strategies towards satisfying the deep deficit of skills shortages and unemployment within the country (Moyo, 2011).

There is a serious lack of Information System skills among educators from basic education. This is educators' problem but affects students negatively and students proceed to institutions of higher learning with the same problem. This calls for special need for educator training in Information system skills and knowledge. Lee (1997) points out that many teachers "of advanced age" will not have had any computer education when in college, and as a result are in need of computer skills training to allow them to make use of computers in their work. On the other hand Preston et al. (2000) stated that teachers felt that they had not had adequate training, particularly in their ability to solve technical problems and in understanding the basic workings of the technology. As a solution to this problem, Snoeyink and Ertmer (2001) suggest that the first stage of training should focus on the basic operations of technology and software applications, and once teachers have acquired the basic skills, only then should they move on to pedagogical training.it looks like Information System was not taken into consideration during teacher training. From now on everyone training for teaching must learn more about Information System among other things.

The department of basic education should arrange ICT special trainings or workshops for educators. This is because educators tend to be reluctant in taking these trainings on their own. Kirkwood et al. (2000) highlighted the fact that expecting teachers to train in their own time caused a slow uptake in the training. Information System training must be compulsory for educators and certificates of competence must be issued. Educators need to be familiarising themselves with the fact that computers are part of today's daily life and must incorporate them into their professional life. Cuckle and Clarke (2002) add that another barrier/challenge to student teachers' use of ICT in the classroom is the lack of ICT pedagogical training in teacher training institutions. It was also stated that some educators come from their teacher training institutions with Information System skills and knowledge. These knowledge and skills get hampered when they start working as there are no Information System resources like computers in their respective schools where they are employed.

Having expressed the need for pedagogic training, there is an evidence to suggest that there is still an important need for training teachers in specific ICT skills (Becta, 2004). Snoeyink and Ertmer (2001) suggest that the first stage of training should focus on basic operations of technology and software applications, and once teachers acquired the basic skills, only then should they move to pedagogical training. Another barrier to student teachers use of ICT in the classroom is the lack of ICT pedagogic training in teacher training institutions (Cuckle and Clarke, 2002). Based on Cuckle and Clarke (2002) argument, it is really amazing that even the newly produced or novice educators still lack Information System skills or ICT skills. During the time of colleges of education, numerous educators were produced lacking computer skills. Those colleges were closed down. Educators today are being produced by universities. All universities in a country are expected to have ICT reliable infrastructure. Therefore all novice educators or those educators being produced by various universities must have computer skills.

The researcher noted that most of educators do not have laptops or do not even bother themselves of buying any due to various reasons. Most of them do not have Information System skills as a result; to buy a laptop is just a waste. Some are afraid of hardware and software high prices and the software need updates continuously. Some are victims of technophobia and fear of failure and they believe of their traditional way of teaching. An attitude towards ICT is another challenge. An umbrella on that is stated above is nothing but a lack of Information System skills among educators. This problem is common among educators, not only in South Africa, but mostly in developing countries. Apart from teachers lack of capacity and attitude toward ICT usage, poor infrastructure remains a major obstacle in many developing states (Howie, Muller & Paterson, 2005).

According to UNESCO (2007) two advanced skills required of graduates in this century were the skill of expert thinking and the skill of complex communication. Expert thinking is the ability to solve problems that lack explicit rules-based solutions, unlike algebra. UNESCO (2007) continues stating that the skill of complex communication is the ability to make effective oral and written arguments, eliciting information from others. These two skills are embedded in information, visual, and technological literacy which are rarely acquired through teacher-centred pedagogy.

Leibbrandt (2010:4) maintain that skills shortage in South Africa develops social illness, particularly in townships and rural areas, whereas it also contributes to prominent levels of unemployment and unequal families. Leibbrandt (2010) continues saying this illness negatively affects the levels of service in the private and public sectors. Wallis (2002) supported this argument. Indicating that skills shortage impacts work performance that is commonly owing to open vacancies that are offered by firms declines the quality of customer service satisfaction…

2.7 Lack of confidence and computer anxiety

Lack of self confidence among certain educators is a real challenge. It needs to be taken into consideration the fact that the challenge students are encountering at tertiary institutions emanates from high schools or from basic education. A very significant determinant of teachers' levels of engagement in ICT is their level of confidence in using technology (Dawes, 2000). Dawes reiterates that teachers who have little or no confidence in using computers in their work will try to avoid them altogether. This calls for time to time special training for educators in using Information System. Most of educators trained in the past do not possess these Information System skills which makes them lack confidence. It is an unfortunate situation that most of educators themselves are working on school where there are no computers or computers are recently introduced to their schools. This is a real challenge to them since they do not have new technology skills required. Levels of access to ICT are significant in determining levels of use of ICT by teachers. (Mumzaz, 2006)

A large number of educators do not possess a required computer or Information System skills. This is one of the reasons why they have anxiety when it comes to Information System. To teach in class using computers or new technology is a real challenge. Larner and Timberlake (1995) found that teachers were worried about showing their pupils that they did not know how to use the equipment, and that it was the teachers who experienced this kind of anxiety who were less willing and / or able to make use of computers in their teaching. Guha (2000) states that students, who

on the whole experience daily interaction with a wide range of technology, are increasingly placing demands on teachers, expecting them to be knowledgeable in the area of computer usage. Odera (2005:337) explains that training of educators in the use of computers could be a step forward in motivating them to change their beliefs about the use of computers and help them to utilise computer technology more effectively in teaching and learning.

In a study conducted by Bosley and Moon (2003), inconsistencies were found between the amount of ICT training received by a teacher and the extent to which the teacher applied that training in the classroom. This statement reveals that most educators just learn these skills and knowledge in teacher training just to pass and receive their qualifications. They don't learn to apply these skills. It looks like they forget everything once they are done with their qualifications. All in all practice make perfect. Educators need to use these skills in classrooms every day. This might boost their confidence and they will get use to new technology. There is a need to provide educators especially blacks and women South Africans and African educators the opportunity to acquire the knowledge, expertise, skills and experience necessary to function as outstanding teachers, researchers and higher education professionals (Badat, 2011)

Lack of confidence among educators is one of serious challenges facing Information System implementation. In Becta's survey of practitioners (2004), the issue of lack of confidence was the area that attracted most responses from those that took part (Bingimlas, 2009). Beggs (2000) asserted that teachers "fear of failure" caused lack of confidence. Balanskat (2000) found that limitation in teachers' ICT knowledge makes them feel anxious about using ICT in classroom and thus not confident to use in their teaching. This literature revealed the secret of student's poor performance in Information System when they get higher learning institutions. Educators themselves are not using Information System skills when they teach because of fear of failure. What can be expected from students? Computers will be always a monster among them. Many teachers who do not consider themselves to be well skilled in using ICT feel anxious about using it in front of a class of children who perhaps know more than they do (Becta, 2004).

In a survey conducted by Pelgrum (2001), revealed that teacher's lack of knowledge and skills is a serious obstacle to using ICT in primary and secondary schools. Lack of teacher competence has been stated as one of challenges that hinder teacher's confidence (Becta, 2004). Empirica (2006) is of an idea that teachers who are not using new technology such as computers in the classroom are still of the opinion that the use of ICT has no benefits or unclear benefits. The researcher of this study is of an idea that an introduction of computer subjects in all schools, starting from primary to high schools should be compulsory. In both primary and secondary schools, the teaching of basic computer principles and word processing skills form the most important component in the teaching of computer literacy (Lundall & Howell, 2000). Both infrastructure and teacher competencies are required for successful implementation of ICT in a school (Venezky and Davis, 2002, p. 40).

Information System seems to be a challenge among certain educators. Those educators are categorised by Rogers (2003) as "Late Majority", those who adopt new ideas just after the average number of a systems. Some are laggards. Some may choose to shy away from the challenge, and yet all teachers are faced with the reality of the Action Plan 2014 (Education, 2010) and the e-Education White Paper (Education, 2003) (Jacobs, 2011). In Jacobs (2011) research article, the place of ICT is clearly outlined as an e-Education policy goal postulating.

E-learning is one way of simplifying education and is the best way of reducing costs and fast tracking an education system.

According to Jacobs (2011) the problem is not limited to South Africa. Evoh (2007) stated that the continent of Africa finds itself faced with competing priorities of which ICT in education is but one. Initiatives by NEPAD (Evoh, 2007) and UNESCO's curriculum for secondary schools speaks volumes of how important it is to ensure that future citizens are able to survive in this information age (Pelgrum, 2001). Across Africa and most developing countries there are many challenges in bringing ICTs into the education process in general (Hennessy, 2010). Relatively few teachers identified infrastructure problems, such as the lack of computers in working condition, unreliable electricity or lack of access to the internet, although these varied by country (Hennessy, 2010). Hennessy continued saying teachers need to be supported to get the most from using ICT in classrooms.

2.8 Lack of technical support

Recent studies stated clearly that lack of educator support and lack of technical support are among challenges associated with Information System implementation in many educational institutions especially in   schools. Without good technical support in the classroom and whole-school resources, teachers cannot be expected to overcome the barriers preventing them from using ICT (Lewis, 2003). Cuban (1999) supports this by pointing out that in the schools that cannot afford technicians, there are often, "software glitches and servers that crash, torpedoing lessons again and again." Once the breakdowns do occur, a lack of technical support may mean that the equipment remains out of use for a longer period of time. Educators willing to implement information System on the subjects they are teaching are scared of technical problems. Once equipment gets damaged it will take a long time to be fixed. Educators do not have technical skills to fix these problems for themselves.

Schools with computers do not have or cannot afford to employ technicians who can look after technical problems. Those educators teaching computer subjects must see to it how they can overcome a problem of computer or printer breakdown. Certain educators offering computer related subjects cannot clear a minor problem of paper jam from the printer. The printer might end up not in use for a long time. Butler and Sellbome (2002) argued that a burnt data projector bulb might take three weeks to be replaced. This is nothing but a lack of technical skills or support. Sometimes a data projector problem cannot be identified. Pelgrum (2001) found that in the view of primary and secondary teachers, one of the top barriers to ICT use in education was lack of technical assistance. Sicilia (2005) agreed saying technical problems were found to be a major barrier for teachers.

Various studies came up with series of technical problems experienced by educators and students. Some of those problems are as follows: printer not responding, network problems like Local Area (LAN), connecting to internet, corrupted files as a result of viruses, outdated software, old hardware, projector output, freezing computers resulting from the failure of Complementary Metal Oxide Semi-conductor (CMOS), limited storage hard drives, slow processing from Random Access Memories (RAM), Lack of updated anti-virus software, fragmented hard drives, and many more.

According to Maldonado (2000) teachers using computers more effectively were more likely to work in schools offering high levels of teacher development on computers and having technology coordinators available to assist teachers with ongoing problems. On the other hand, Carnoy (2004) stated that teachers cannot develop higher order thinking skills in students without having acquired such skills themselves and to a much greater depth than the material they are supposed to teach. Educators are expected to use ICT skills in teaching and let their students acquire these kills as well but not to forget that they might lack technical skills. Schools need to ascertain that technical support is also available for educators. Technicians should be available to attend technical problems on computers and other Information System devices and software problems.

In a study conducted by Ramorola (2010) it was stated that "In order to provide a uniform standard of technology education in secondary schools, the Department of Education (DoE) produced computer syllabi specifically for Computer Applications Technology (CAT) which was lately followed by the introduction of Information Technology (IT)". In spite of the department initiative, a large number of schools do not offer any computer related subject.

2.9 Theoretical framework

This is a collection of interrelated concepts, like a theory but not necessarily so well worked-out. In this study a "Diffusion of innovation" theory was followed. Diffusion of innovation is defined as a theory that seeks to explain how, why and at what rate new ideas and technology spread. Rogers (2003) argues that diffusion is the process by which an innovation is communicated over time among participants. Rogers further argues that diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication, in that the messages are concerned with new ideas. The reason of incorporating this theory in this study it's because tertiary institutions students in particular are anticipated to come up with new ideas in Information System, adopt and let others adopt these ideas.

On the other hands, (Hargreaves, 2004) proposed that "learning to do things differently in order to do them better". A general definition of the term innovation is the introduction of something new that is intended to be useful (Whitehurst, 2009). Rogers's diffusion of innovation is categorised in three main types which are continuous innovation, dynamically continuous innovation and discontinuous. For the purpose this study a continuous innovation was adopted as it relates to Information System implementation. College student are expected to adopt this theory in order to better their Information System performance and their education at large.

Rogers (2003) said it well that "getting a new idea adopted, even when it has obvious advantages is difficult". According to Jacobs (2011) this is telling of the perception that some teachers have about integration ICT into the realm of reference for curriculum delivery. Like any other human being certain educators are reluctant if not afraid to use Information System skills on their classrooms. Some are terrified by new technology while some believe on traditional methods of teaching. It is up to educator's shoulders to ascertain that ICT skills are in use on their classrooms as a basic requirement to the outside world. To appreciate innovation theory (Rogers, 2003) one need to establish the understanding of the words within the theory.

According to Rogers (2003) the adopter, in this case the teacher, of the innovation in ICT goes through five stages before incorporating the innovation into the frame of

reference. According to Rogers (2003) the process pertains to a number of choices that is taken by the individual coupled with actions where a proposed idea is evaluated and considered for adoption. In a research article Jacobs (2011) stated five stages, as stated by Rogers (2003) that will serve as criteria in identifying whether a teacher considers themselves to be on this proposed continuum. The stages are as follows:

1. Knowledge pertains to the educator being made aware of the innovation's existence and getting to grips with his functioning.

2. Persuasion refers to the instance where a positive or negative attitude is developed to the innovation.

3. Decision is taken about the choice of accepting or refusing the innovation after participating in actions practising the innovation.

4. Implementation takes place when the fresh innovation is put into use by the individual teacher.

5. Confirmation is taken when support of the decision regarding the innovation is sought from peers, and may results in a decision being overturned if adverse messages are experienced.

Rogers (2003)

As a matter of interest the five categorization (Rogers, 2003) are as follows: innovators, Early Adopters, Early Majority, Late Majority and Laggards. Most people fall into the Early Majority and Late Majority categories. The characteristic used to describe the Early Majority is that of people who "adopt new ideas just before the average number of the system" (Rogers, 2003) and the Late Majority are prone to "adopt new ideas just after the average number of a system" (Rogers, 2003). Among educators themselves there are those who at the early stage realised an importance of Information System and grab it immediately, the *Early Majority*". Those educators ascertained that they equip themselves with new technological skills through short

courses and workshops to keep themselves updated with new technology. There are those educators who just ignored this innovation and they are now forced by the education system to start equipping themselves, the *Late Majority*. As per Rogers (2003) explanation, it looks like a large number of people falls under the so-called the Late Majority.

Five Adopter categories

> (1) Innovators – 2.5%
> (2) Early adopters – 13.5%
> (3) Early majority – 34%
> (4) Late majority – 34%
> (5) Laggards – 16%

Rogers (2003)

DIFFUSION OF INNOVATION

Category	Sales
Laggards	16
Late Majority	34
Early Majority	34
Early adopters	13.5
Innivators	2.5
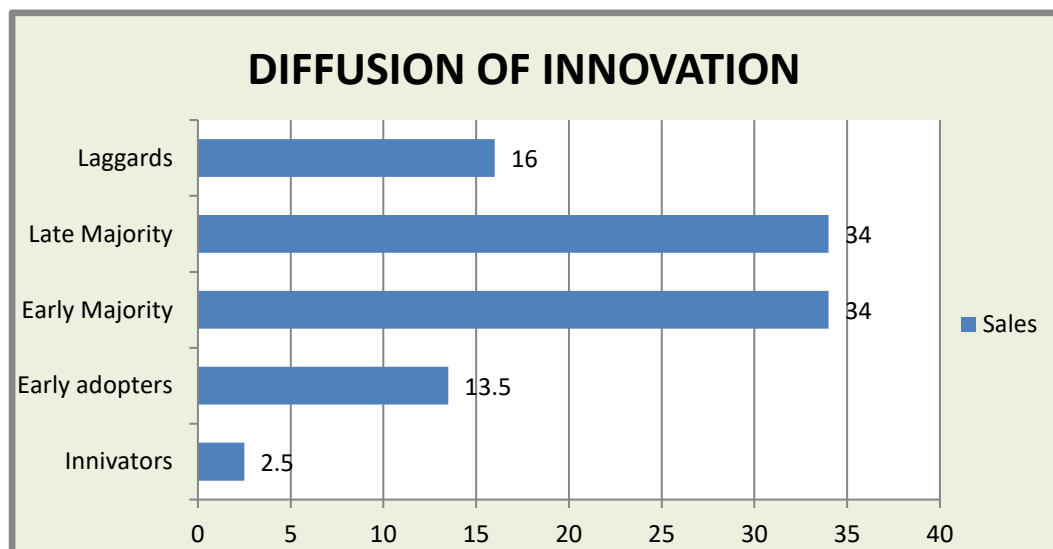
Figure 2.1: Source: Researcher (2016)

In a scenario of Innovators, Early Adopters, Early Majority, Late Majority and Laggards stated by Rogers (2003), the researcher in this study can make an example of one social network, "Facebook". When Facebook was introduced, there were "Early adapters" and "Early Majority" who sees an idea a good social network that they can use to communicate, share files and find their old friends using this network. That was just a minority in various communities. As time goes by, a large number of people join and created accounts on Facebook. These ones belong to "Late Majority". A number of people today have accounts on Facebook and they are using the

network almost every day. Some are even addicted as they tend to spend their available time and nights on Facebook.   There are also the so-called "Laggards" who tend to do or join things very late. Some people are reluctant and conservative. They don't want to bother themselves with these so-called social networks and they believe these networks are anti-social.

The pervasiveness of ICT has brought about rapid technological, social, political, and economic transformation, which has eventuated in a network society organised around ICTs (Yusuf, 2005). An educator without Information System skills is in a serious trouble. Information System skills are now required in all professions. Isaacs (2007) stated that adoption by the teachers will enhance effective teaching. Classroom teachers with adequate and professional skills in ICT utilisation will find their students performing better in learning, because modern technology offers many means of improving teaching and learning in classroom (Lefebvre, Deaudelin, & Loiselle, 2006) According to Ntemane, (2012), one major trend of educational reform is geared towards teachers and students acquiring and using Information Technology as a valuable asset to the learning process.
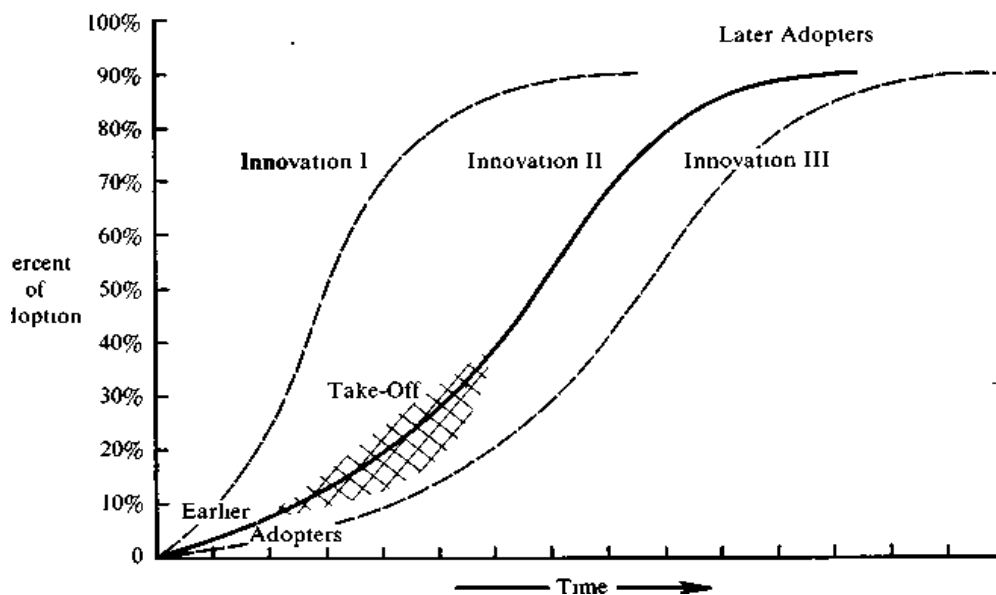
Figure 2.2 Rogers (2003) diffusion of innovation process

Diffusion of innovation seeks to explain how innovations are taken up in a population (Robinson, 2009). Robinson also states that an innovation is an idea, behaviour, or object that is perceived as new by its audience. Unlike Rogers who categorised

diffusion of innovation in five stages, Robinson (2009) stated that Diffusion of innovation offers three valuable insights into the process of social change as follows:

1. What qualities make an innovation spread?

2. The importance of peer-peer conversations and peer networks.

3. Understanding the needs of different user.

According to Robinson (2009) these insights have been tested in more than 6000 research studies and field tests, so they are among the most reliable in the social science. Diffusion of innovations takes a radically different approach to most other theories of change (Robinson, 2009). Instead of focusing on persuading individuals to change, it sees change as being primarily about the evolution or "reinvention" of products and behaviours so they become better fits for the needs of individuals and groups (Robinson, 2009). In his article Robinson (2009) ask the question "Why do certain innovators spread more than others? And why do others fail? According to diffusion scholars there are five qualities that determine the success of an innovation. These qualities are:

1. Relative advantage
2. Compatibility with existing values and practices
3. Simplicity and ease of use
4. Trialability
5. Observable results

Robinson (2009)

According to Rogers, these five qualities determine between 49 and 87 percent of the variation in the adoption of new products. (Rogers, 2003)

Traditional way of teaching and learning was good. What is new and better brought by new technology today? According to Drent and Meelissen (2007) ICT aims to enhance the learning process for students and not to operate as the focal point and should be regarded as a tool which encourages innovative methods of teaching and learning. Pachler (2001) support this idea by stating that "the ability of learners to

know how to learn, and the training in thinking and problem solving skills and not on computer skills per se" (Pachler, 2001) also indicated that educators are tasked with the moral obligation to prepare young people adequately for their adult lives in today's and tomorrow's world.

2.10   Summary

Numerous studies conducted and acknowledged in this study indicated that there are shortcomings in as far as teaching of Information System or related subjects are concern. These shortcomings seem to be common on both basic education and to the institutions of higher learning. These shortcoming need to be addressed in order to improve students' performance in Information System and their entire academic performance at large.   Lack of Information System resources, lack of technical support, lack of confidence accompanied by anxiety and absence of infrastructure seem to be the serious problems affecting an implementation of computer subjects. Various literature consulted indicates the common problems in the field of Information System.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1   Introduction

This chapter incorporates the research design and methodology of this study. The chapter follows a chapter that dealt with lot of literature and theoretical framework which was based on "Diffusion of innovation**".** Ntuli (2011:40) refers to theoretical framework as a foundation of exploring problem further through the use of data collection instrument. In this chapter the research methodology and design used in the study is described. Research approach, sampling, data collection techniques and ethical consideration are also described. Through semi-structured interviews with college lecturers and management members data was collected while focus group with students was also utilised. The chapter's focus is on research design and methodology used in data collection, description of population and sample as well as ethical consideration.

3.2   Research Methodology and Design

Qualitative methodology is used in this study. Qualitative research method was followed in order to explore and describe the challenges or problems encountered by NATED Information System students at Majuba TVET College. This methodology was able to identify the challenges faced by students in Information System. Through this methodology, NATED students' challenges in Information System could be identified. According to Johnson & Christensen (2012), qualitative research allows the researcher to have an opportunity of gaining a clear picture of what is happening on a particular situation.

In qualitative research, the researcher is actively involved and attempts to understand and explain social phenomena in order to solve what Mason (2002: 18) calls the "intellectual puzzle". Qualitative research may achieve depth and breadth (Blaxter, 1996), on the other hand, (Mason, 2002) states that it is the most appropriate approach for studying wide range of social dimensions, while maintaining contractual focus.

Information System lecturers and management team from Majuba TVET College became participants in this study. The method, qualitative was also used to allow participation of people who were directly involved to the problem, the students. The findings of this study will also help the very same participants to improve computer subjects' results or their performance at the College.

3.3   Research approach

According to Maree (2012) "qualitative research methodology is concerned with understanding the processes and the social and cultural contexts which underline various behavioural patterns…" this study followed a qualitative research approach to explore the factors that contributed negatively on students' performance and attempt to come up with possible solutions/ recommendations. Schumacher (2010, p.321) pointed out that qualitative research allows the observing of behaviour as it occurs naturally and there is no control of behaviour or settings and there are no externally imposed constrains. On the other hand, Ormond, (2005, p.133) states that qualitative research methodology allows the researcher to gain new insights about a particular phenomenon, develop new concepts or theoretical perspectives about the phenomenon and discover the problems that exist within a phenomenon.

Qualitative research as a research methodology is concerned with understanding the processes and the social cultural contexts which underline various behavioural patterns and is mostly concerned with exploring the 'why' questions of research (Kobus, 2010). This research method is followed in order to explore and describe the challenges or problems faced by Information System students (Glesne, 2006).

Schumacher and McMillan (2010, p.20) refers to research design as the plan and structure of the investigation used to obtain evidence to answer research questions. On other hand, Mac Kendrick (1987:256) who states that the research design is an overall plan or strategy by which questions are answered by testing hypothesis. Cresswell (2008) stated that qualitative research method also attempt to discover what is assumed to be a dynamic reality while focussing primarily on understanding specifics instead of generalisation of universal laws of behaviour. Cresswell (2009) further stated that qualitative research aims to understand a research problem from the perspective of the people it involves.

According to De Vos, Strydom, Fouche and Delport (2002:79) the qualitative research paradigm, in its broadest sense, refers to the research that elicits participant's accounts of meaning, experience or perceptions. De Vos et al (2002) also maintained that qualitative approach produces descriptive data in the participant's own written or spoken words.

3.4   Research setting

Research setting refers to the place where data was collected. The study was conducted at Majuba TVET College in Newcastle, KwaZulu-Natal where three out of five College campuses were sampled. These campuses were Information Technology and Business (ITB), which is situated at Berry Hertzog Park in Newcastle. The second campus was Centre for Peoples Development (CPD), which is situated in section two at Madadeni in Newcastle. The third one was Majuba College Dundee campus situated about 64 kilometres from town of Newcastle. The reason of choosing these campuses was the fact that in these campuses is where Information System is mostly offered. To collect data from such campuses will benefit this study. Number of lecturers offering Information System and numerous students doing these subjects are found in these campuses.

3.5   Population and sampling

Purposive sampling was suitable and was used for this study. The population and sample providing data was targeted on certain specified Majuba TVET College lecturers offering Information System at three different campuses whereby Information Technology and Business (ITB), Centre for People's Development (CPD) and Dundee campuses were the main focus. The reason for selecting participants from these campuses was due to the fact that they can provide the required, relevant and more appropriate data regarding the challenges encountered by students in Information System or computer subjects. In these campuses is where the researcher finds a large number of students doing computer subjects and numerous lecturers

offering these subjects as well. According to Maree (2007:79), the word 'sampling' refers to the process used to select a portion of the population for the study.

According to Burns and Grove (1993:779), a population is defined as all elements (individuals, objects and events) that meet the sample criteria for inclusion in a study. Focus group interviews with NATED Information System students also formed part of this study. One advantage of focus group in a study is the fact that a researcher can have access to how people talk to each other. An interviewer has a little to say since communication within group members come up with lot of data needed in a study. In this setting there is a lot of interaction among group members and the analysis will be done at group level than individual analysis. This is another saving time technique for the researcher.

Ormrod (2005: 145) pointed out that purposive sampling involves the selection of individuals who are in a position to provide sufficient information on the topic being discussed. This sampling assisted the researcher to derive in-depth knowledge through semi-structured interviews from relevant participants. The choice of these participants is based on their Information System knowledge, skills, experience and expertise. Henning (2004:71) maintains that purposive sampling and snowball sampling are related and have one common denominator: "the most people suitable to 'wander with' on the research journey are selected at the time they are needed. Tale and De Villiers (2004:242) sees large sample in qualitative research may lead to generation of an amount of data that is difficult, if not impossible, to manage and to analyse in meaningful way. The researcher in this study calls for small sample as to collect and utilise a manageable data.

Selection of six Majuba TVET college lecturers offering Information System subjects was made in semi semi-structured interviews. A Sample of six lecturers of Information System and ICT related subjects from the same institution were organised. Two lecturers per campus and one Head of ICT department per campus were interviewed. Three campus managers were also interviewed, one manager per campus. Purposive sampling was utilised because the field of ICT does not need anyone but people who are knowledgeable and skilled. This is a selective or subjective kind of sampling. Selection of participants who are familiar and possess relevant skills and

experience is of cardinal importance. This is a kind of sampling require individuals with expertise. In many cases purposive sampling is used in order to access knowledgeable people', i.e. those who are in depth knowledge about particular issues (Cohen, Manion and Morrison, 2007). In this study, a convenient sample of 34 subjects as stated in the table below was selected in three Majuba College campuses.

In- Depth Interviews Sampling Table

Table 3.1

PARTICIPANTS	NUMBER	TOTAL HOURS
Campus Managers	1 x 3 = **3**	1 ½ Hours
HOD's	1 x 3 = **3**	1 ½ Hours
Lecturers	2 x 3 = **6**	3 Hours
Students (Focus groups)	3 x (8 students per group)	3 Hours

3.6   Instrumentation and data collection techniques

Creswell (2009) stated that the most common sources of data collection in qualitative research are interviews, observation and review of documents. Semi-structured interviews with lecturers and management members were conducted and focus group with students were utilised. Interview schedule was used as a vital tool of collecting required and useful data. Additional questions, not appearing on schedule aroused due to the nature of responses from participants, adding more data. Focus group was convenient because the researcher was able to collect a large volume of

data in a very short time. The focus group is fundamentally a way of listening to people and to create lines of communication (De Vos et al 2002:306). In-depth individual interviews among Information lecturers were conducted in a way that it collects information based on lecturer's knowledge, experiences, expertise and contribution to this field. Participants provided data freely knowing that only anonymity is taken care of in this study. According to Glesne (2006:147), analysing conversations helps the researcher to get insight into experiences so that meaningful interpretations could be made. Glesne (2006) also stated that Interviews should stimulate responses from interviewees that generate opinions, perceptions and attitudes in order to illuminate the phenomenon of inquiry. Glesne (2006:36) also supports the idea of hosting multiple categories of interviews and stated that the more sources tapped for understanding, the richer the data and the more believable the findings.

The distinctive feature of observation as a research process is that it offers an investigator the opportunity to gather "live" data from naturally occurring social situations (Cohen, et al., 2007). Cohen also state that in this way the researcher can look directly at what is taking place *in situ* rather than relying on second hand account. Robson (2002: 310) says, what people do may differ from what they say they do, and observation provides a reality check. An interview allows the researcher to get data from the horse's mouth and can be recorded for replay.

Semi-structured interviews with specific College lecturers and college management team were conducted. Coding was used as a system of analysing data. The reason of including lecturer's participation is that this problem affects their profession in a negative way. The Interview is undoubtedly the most common source of collecting data in qualitative studies (Thomas, Watson, Spear, 2010). Data was also collected from senior college management. The researcher's reason to collect data from college senior management is that the management use to keep the records for entire college results statistics including that of Information System. In keeping with Glesne (2006:36), multiple data collection methods promote trustworthiness and confidence. The primary advantage of in-depth interviews is that they provide much more detailed information than what is available through other data collection methods, such as surveys. According to Glesne (2006:147), analysing conversations helps the

researcher to get insight into experiences so that meaningful interpretations could be made.

Consultation with other academics and other education stakeholders inter alia lectures, Information and Communications Technology (ICT) expect and college management was made. Sources like internet was also used as a system of collecting required data from various and relevant websites. Semi-structured interviews and telephone conversation with relevant participants inter alia Dundee campus lecturers which are few kilometres away from Newcastle but forms part of Majuba College was also organised. Articles published in the journals, websites and textbooks were consulted. In this study, the researcher collected data using the literature from the year 2000 to 2016 and student performance from 2010 to 2015 in order examine the past six years Information System results.

3.7   Data analysis and interpretation

The recorded semi-structured interviews were transcribed verbatim and these was organised into categories and themes. A recording laptop was used to capture/record these interviews and the recording was analysed. Burns and Grove (1997:521) defined data analysis as "a method to reduce, organise, and give meaning to data gathered and constructed into a meaningful whole." while De Vos (1998:100) view data analysis as the process through which one understands more about the phenomenon under investigation and describes what one has learnt with a minimum of interpretation.

Researcher also complimented the interviews with notes written during the data collections process. The researcher started by reading the interview transcripts and replays the recorded data on a laptop for better capturing. In a long responds the researcher tried to reduce and to paraphrase the participant respond for better understanding. On semi-structured focus group transcript lot of unimportant and irrelevant data was included. The researcher simply took an important material only. Despite the fact that interviews were recorded, the researcher also took some notes

for each interview conducted as a way of supplementing and audio captured data. These notes were used in conjunction with audio data. Data was analysed based on information gathered from all participants.

3.8   Data storage

Hard and soft copies of data will be securely stored for five years. Soft copies or digital format copies will also be stored in a safe and locked place in my house as per requirement.

3.9   Permission to conduct a research

The permission to conduct a research/ collect data was given by University of South Africa ethics committee, Majuba TVET College (Appendix C) and department of higher education. The researcher received a written permission from the above mentioned stakeholders to conduct research.

3.10   Data collection procedure

All three managers from three different Majuba College campuses which are Information Technology and Business (ITB), Centre for Peoples Development (CPD) and Dundee campuses were telephonically contacted to let them know of the study. Explanation about the purpose of the study was given to all of them in writing. Appointments were made to meet them for semi-structured interviews as they were requested to be the participants to the study. Semi-structured interviews also allow informants the freedom to express their views in their own terms. A semi-structure interview is also able to provide reliable, comparable qualitative data. The purpose of the research interview is to explore the views, experiences, beliefs and/or motivations of individuals on specific topic. Interview schedule was used.

Cohen (2011: 351) indicated that researchers utilise semi-structured interview as they allow collecting of detailed picture of the participant's beliefs and perceptions of a particular subject. Key informant interviews will be used, as they are in-depth

interviews of individuals who are well acquainted with the subject under investigation and are willing to share with the researcher Schumacher (2010:355)

 The researcher prepared letters for each manager of the campus and later letters addressed to each campus manager were delivered to all three campuses requesting to avail some time for the researcher to meet them for an interview. Copies of these letters are attached as appendix G.

Same procedure was followed to invite lecturers and students in a form of focus groups to be the participants in a study. Lecturers were also requested to participate and relevant letters were given to six participating lecturers respectively as per their field of specialisation in Information System. All were notified that their participation was voluntary and information given.

After the permission was granted, the researcher visited all three campuses to collect data from relevant participants. Data was collected through se-structured interviews from college employees and through semi-structured group interview from students. The latter method was good in the manner that it is able to produce large amount of data on a topic in a short time. The recording of focus group data was done despite its challenges that it was not that easy to identify the voice of the participant talking since participants tend to talk in overlap. According to De Vos et al (2002:310) and Litosseliti (2003:2), in focus group interviews, participants feel comfortable in sharing their experiences and perceptions of a topic in group activity Once the actual interviews are conducted, the next step would be to transcribe. The researcher would use Thematic Analysis approach which is a qualitative data analysis strategy that focuses on identifiable themes and patterns of living and/ or behaviour, and suitable for analysing and reporting personal qualitative interview data (Biggam, 2008, Krombo & Tromp 2006, Mutch, 2005).

The following steps would be adopted in making use of thematic analysis:
- Perusing the collected data and then identifying information relevant to the research questions and objectives
- Develop a coding system based on the samples of the collected data e.g. what are the issues? Who said what? Commonalities? , differences? Trends? Reasons?
- Re –read the texts and then highlight the key quotations

- Indicate the major themes in the margins (what emerges as major categories and subcategories?)
- Place the coded material under the major themes identified

3.11   Ethical consideration

For the purpose of this study, ethical clearance was given by the University of South Africa (UNISA) ethics committee to conduct the research in in this field. Permission was given by Majuba TVET College management and Department of higher education (DHET). According to Leedy and Ormrod (2001), the researcher should ensure that participants are not exposed to any undue physical or psychological harm. On the other hand Kumar (2005:212) is of an opinion that "It is unethical to collect information without the knowledge of the participants, and expressed willingness and informed consent".

Arrangements were prepared by researchers to carefully protect the confidentiality of research subjects and to protect data provided. All personal information collected was considered privileged information and was dealt with in such a manner as not to victimise the personal dignity of any participant or to infringe upon their right to privacy. The researcher in this study ascertained that this is taken care of.

In the interviewing process the researcher presented the participants with the consent letters which describe the research process. The participants were also notified verbally that they are free to withdraw at their sooner convenient time if they are no longer comfortable with the process, they can also refuse to answer questions that they do not wish to answer. This gave them freedom to provide as much data as they wish. Participants were also assured of anonymity and confidentiality.

3.12   Summary

In this chapter the research methodology, research design, tools and techniques used in this study were discussed. There were no challenges associated with chosen methodology, accessing required data in any form. Ethical clearance was also taken care of; participants were notified about their rights as they take part in the study. They also know that they can withdraw if they are no longer comfortable.

Data collected through semi-structured interviews from relevant participants is analysed on the next chapter which focus mainly on data analysis.

CHAPTER FOUR

INTERPRETATION AND ANALYSIS DATA

4.1 INTRODUCTION

Study results were interpreted and analysed in this chapter and the findings discussed at the later stage. This chapter discusses the data analysis and interpretation from 18 semi-structured interviews conducted on campus managers, HOD's, lecturers and student focus groups in three out of six Majuba TVET College campuses presented as campus A, campus B and campus C. To identify the stakeholders' perceptions of the challenges encountered by NATED Information System students at Majuba TVET College was the concern in this study. The purpose was to find out what are the stakeholders' perceptions of the challenges encountered by National Accredited Technical Education Diploma (NATED) Information System students at Majuba TVET College. To identify the challenges can be a solution to student's poor performance. Themes were used to analyse data collected through semi-structured interviews.

The objectives of this study were as follows:

- To identify the challenges experienced by the NATED Information System students.

- To assess the perceptions of the NATED Information System lecturers of the challenges encountered by students.

- To assess the perceptions of the college management of the challenges encountered by NATED Information System students.

- To explore strategies that can be implemented to eliminate the challenges faced by NATED Information System students

Collected data was sub-divided into three categories: the management perception, lecturer's perception and students concerns using focus groups. In other words, data collected from management team was analysed separately from the one collected from lecturers and students respectively.

Interview questions created or used in data collection for this study were based on different themes used in each category. To analyse data, the researcher used different questions in each theme from interview schedule. Due to the nature semi-structured interviews, additional questions came up during interview processes.

4.2 THE MAJUBA TVET COLLEGE CONTEXT

Majuba College is among fifty or fifty three TVET Colleges across South Africa. The College is situated in Newcastle, northern Kwazulu-Natal province. The college has six campuses in total specialising in various fields. The main fields of specialisation are Information Technology (IT), Business studies and engineering. Five campuses are situated in Newcastle and one campus in Dundee, few kilometres from Newcastle. These campuses are Newcastle Technology Centre (NEWTECH), situated in town (Newcastle) and specialising in engineering, Newcastle Training centre (NTC) also in town, specialising in engineering. Another campus also specialising in engineering is Madadeni Technology Centre (MTC). This one is situated in Madadeni Township in Newcastle. Information Technology and Business (ITB) campus and Centre for People's Development (CPD) are specialising in IT and Business studies, situated in town and the latter in Madadeni Township. The last one is the Dundee campus, also specialising in IT and Business situated in Dundee. The central office is situated in town (Newcastle), to service all campuses with all teaching and learning services. Looking at the top management, there is a rector or principal who is looking after all six campuses. Each campus has a campus manager, looking after that particular campus.

It is imperative to state that the focus of this study was on three campuses only, specialising in IT and business studies. These campuses are referred to as campus A, campus B and campus C in this study. Information System is dominant to all three

campuses. Large number of students doing Information System subjects and large number of lecturers offering these subjects are on these campuses.

Computer subjects (Information System) offered at Majuba TVET College in three different campuses are as follows:

- Computer Practice (CP)
- Information Processing (IP)
- Computerised Financial System (CFS)
- Introductory to Computer Practice (ICP)
- Office Data Processing (ODP)

The first four are offered in report 191 or National Accredited Technical Education Diploma (NATED) syllabus which enrols those students who completed their matric or who possess National senior certificates or those who completed their National Certificate Vocational (NCV). These students start their College studies from N4 to N6. Duration in NATED is eighteen months at the college campus and another eighteen months in-service training which makes up three years to complete a diploma.
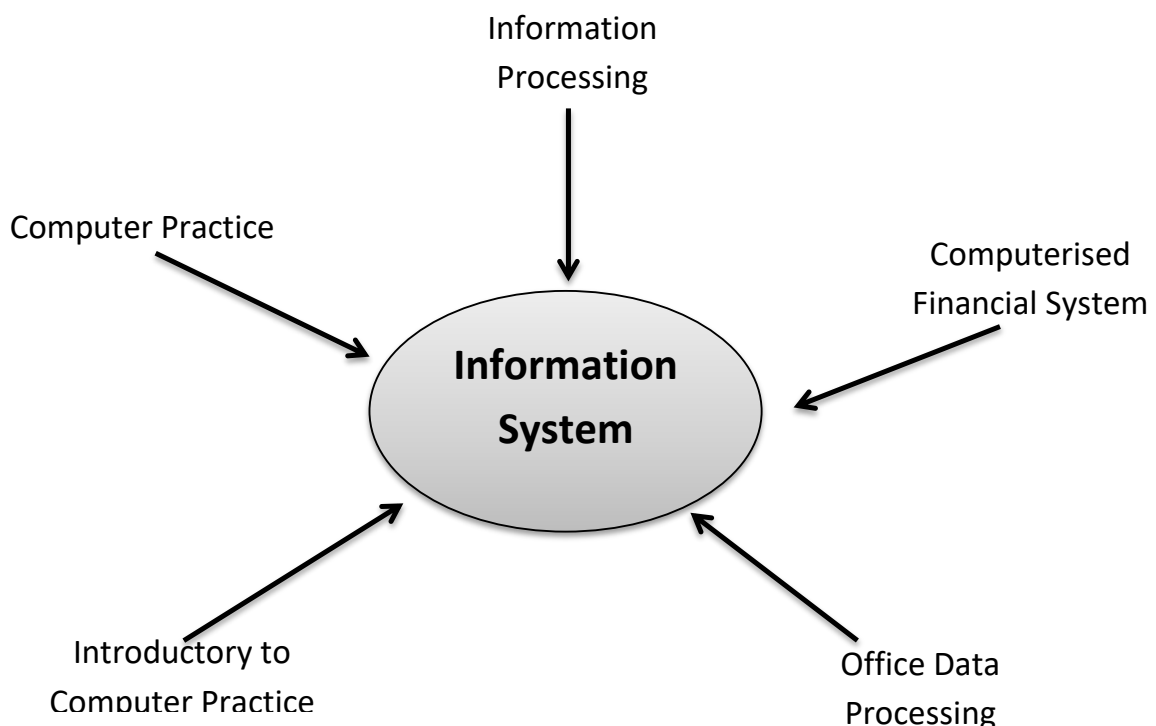
Figure: 4.1 Information System subjects offered: Source: Researcher (2016)

4.2.1 College Campuses as Study Sites and Programmes Offered

In the field of IT and business, the College offers four programmes as displayed on the table 4.1 which are Management Assistant (MA), Business Management (BM), Financial Management (FM) and Hospitality. All programmes contain subjects which have to do with computers or Information System. Management Assistant students have two subjects which have to do with Information System which are Computer Practice (CP) and Information Processing (IP) from N4 to N6.

Business Management student use to be introduced to computers with Introductory to Computer Practice (ICP) which they do in N4 and they proceeds to N5 and N6 with Computer Practice. On the other hand those who are doing Financial management have Computerised Financial System (CFS) from N4 to N6. Hospitality students have only one semester of in Computer practice. It must be noted that all programmes have four subjects per semester.

Empirical data was collected from three college campuses which were campus A, campus B and campus C respectively.

Campus A
The campus is situated in town (Newcastle) offering IT and Business studies. The campus caters for both NCV and NATED curricula. NATED programmes offered from N4 to N6 are:
- Business Management
- Management Assistant
- Financial Management
- Hospitality

Data was collected from the following participants:
Campus Manager, Head of Department (Information System), Senior lecturer (Computer Department), lecturer 1+ lecturer 2, students focus group (8 Student per group)

Campus B

The campus is situated in Madadeni Township (Newcastle) offering IT and Business studies. The campus caters for both NCV and NATED curricula. NATED programmes offered from N4 to N6 are:

- Human Resource Management
- Business Management
- Management Assistant
- Financial Management
- Hospitality

Data was collected from the following participants:

Campus Manager, Head of Department (Information System, Senior lecturer (Computer Department), lecturer 1+ lecturer 2, students' focus group (8 Student per group)

Campus C

The campus is situated in Dundee offering IT and Business studies as well as some engineering programmes. The campus caters for only NATED curriculum. NATED programmes offered from are:

- Human Resource Management
- Business Management
- Management Assistant
- Electrical engineering
- Mechanical engineering

Data was collected from the following participants:

Campus Manager, Head of Department (Information System, Senior lecturer (Computer Department), lecturer 1+ lecturer 2, students' focus group (8 Student per group, randomly selected males and females from different levels)

Table 4.1 Programs and Information System subjects at business campuses

Programme	Information System subjects	Levels
Management Assistant (MA)	Computer Practice	N4, N5, N6
	Information Processing	N4. N5. N6
Business Management (BM)	Computer Practice	N4 & N5
	Introductory to Computer Practice	N4
Financial Management (FM)	Computerised Financial System	N4, N5, N6
Hospitality	Computer Practice	N6

4.2.2 Description of the Study Participants

The study participants were College campus managers, Head of Departments (HOD's), from three campuses, lecturers offering Information System and student focus groups. To integrate all data collected through semi-structured interviews, coding system is used in this analysis. Coding is an analytical process in which data, in both quantitative form (such as questionnaires results) or qualitative (such as interview transcripts) is categorised to facilitate analysis (Wikipedia: 2016). Coding means the transformation of data into a form understandable by computer software.

> *Coding is defined as "a systematic way in which to condense extensive data sets into smaller analyzable units through the creation of categories and concepts derived from the data."*

"Coding is the process by which verbal data are converted into variables and categories of variables using numbers, so that the data can be entered into computers for analysis."

Jessica True

Table 4.2 Characteristics of Participated Campuses

Campus	Location	Participants	Qualifications	Programmes	IS subjects	Languages
Campus A	Newcastle	CM HOD Lectures Students		MA BM FM HOS	CP IP CFS ICP	English & IsiZulu
Campus B	Madadeni	CM HOD Lectures Students	Hidden	MA BM FM HOS	CP IP CFS ICP	English & IsiZulu
Campus C	Dundee	CM HOD Lectures Students		MA BM FM HOS HR	CP IP ICP	English & IsiZulu

CM – Campus Manager CP – Computer Practice
MA – Management Assistant ICP – Introductory to Computer Practice
BM – Business Management IP – Information Processing
FM - Financial Management CFS – C computerised Financial System
HR – Human Resource Management HOS – Hospitality Studies
HOD – Head of Department

In table 4.2 above, it must be stated that qualifications are not displayed (hidden) because some participants were reluctant to reveal their qualifications and years of experience.

4.2.3 Description of Focus Groups

The focus group at campus A was made of five female participants and three males from various programmes. All participants were Information System students from N4 to N6. Females are dominant in this campus as compare to engineering campuses. The participants on this focus group come from Business Management programme, Management Assistant, and Financial Management. Various participants are doing the following Information System subjects; Computer Practice (CP}, Information Processing (IP), Computerised Financial System (CFS) and Introductory to Computer Practice (ICP)

At the beginning of an interview some participants were not free enough, panicking and not sure what was expected from them. During the interview process all of them including those who were shy and showing fear started participate freely. They realise that there was no right or wrong answer; they had to say what they know about their Information System subjects and their experiences and college students. Towards the end all participant were happy showing eager to provide more data.

In Campus B focus group, there was a gender balance. The group was composed of four female participants and four males. The group was dominated by Computer Practice students and Information Processing students, all from two programmes; Management Assistant and Business Management. The participants also were randomly selected from N4 to N6. Participants from N6 were able to give more of their experience considering all difficulties they gone through from N4 when Information System subjects were firstly introduced to them and those hectic times of using computers for the first time. According to them those times are gone and now they are more than ready to tell their story.

Campus C is the smallest college campus but like any other campuses, a group of six male participants and two female totalling to eight participants was formed. Similar to other focus group, there was that fear at the beginning of the interview. As the interview continues, they also realise that there was no penalty for wrong answer or an award for the correct one. Management Assistant, Human Resource Management and Business Management programmes were represented in this focus group. Towards the end of an interview process, participants were scrambling to give answers as per their experience.

4.3   DATA ANALYSIS

Themes of this study were sub-divided into three categories which were management perception; lecturer's perception and students' focus groups. Finding about Management perceptions, lecturer's perceptions and students focus groups were analysed separately based on various themes. The analysis of this study will focus on the themes displayed on the table 4.3 below.

Table 4.3 Themes

	Management Perception *(Semi-structured interviews)*		Lecturers Perception *(Semi-structured interviews)*		Students Concerns *(Focus groups)*
Theme 1	Challenges identified	Theme 1	Staff challenges	Theme 1	Lack of basic skills
Theme 2	Eliminating strategies	Theme 2	Level of Academic Competency	Theme 2	Access to resources
Theme 3	Support System	Theme 3	Support from management	Theme 3	Technophobia
Theme 4	Resources	Theme 4	Background	Theme 4	Challenging fields
Theme 5	Management role	Theme 5	Lecturer's role	Theme 5	Students role

4.3.1   Management Perceptions

4.3.1.1 Theme 1: Management Related Challenges identified

As per data provided by different participants it was explicit that challenges facing both management and lecturers also affect students themselves and their academic performance negatively. The question is: who is going to address these challenges if it is not the college management on campus levels and senior management at central office?

Classroom attendance

It is unfortunate that some challenges being experienced by the management, the main course are students themselves. The college management is concern about student's poor attendance. According to the College management participants, student poor classroom attendance contributes negatively to their academic performance. One participant clearly stated that:

> *"Classroom poor attendance among students is one of the challenges that reduce college certification rate. Students tend to be absent for no valid reasons. There are those who claim not to have money for transport, some they said they cannot cope because they don't have rental fee at the end of the month and some cannot provide reasons for being absent. Some parents try their level best to assist their children with transport or accommodation fees. Large number of students receives NSFAS as it is less than ten percent of students not studying with this financial aid scheme."*

Data provided by the participant above is really confusing and sometimes unbelievable. More than 90% of college students do benefits from government financial aid scheme called National Students Financial Aid Scheme (NSFAS). All beneficiaries of this scheme receive tuition fee, accommodation and transport fee each semester. It was also the findings of study that some parents also support their children with rental fee or so-called pocket money. The question of student's absence from lecture rooms cannot be considered to be the reasons mentioned by one participant above. It was clear that these students who tend to miss lectures tend to be absent for their own reasons which has nothing to do with financial constraints.

On the other hand, one cannot run away from the fact that this financial aid scheme use to pay student very late which results to their unrest. Their unrest resulting from NSFAS issues also contributes to their absence because during these unrests they tend to be away from classrooms. This was stated by one participant who said:

> *"Student's unrest over the issues of NSFAS tends to disrupt semester plan or year plans. Insufficient funds received by students due to high*

demand from different institutions of higher learning are challenges on
its own."

College capacity

The findings of this study also revealed that limited floor space on campus A have a negative impact to student performance in Information System. It was clear that shortage of floor space also limits a number of computers in a campus. Shortage of computer labs means shortage of computers in a campus. This also means students do not have sufficient resources to do their daily college work. They cannot do their practice as to improve their performance in Information System or any academic work as expected. The issue of floor space shortage was outlined by one participant who argued that:

> *"Shortage of floor space where we can put more computers for*
> *student is a challenge. We need to increase a number of classes and*
> *computer labs so that we can avail more computers for students to*
> *practice. All computer labs that we have are always occupied*
> *throughout the day. Both NCV and NATED students and lecturers are*
> *sharing the very same laboratories. That is another reason why*
> *computers get damaged time to time. The college needs to set aside*
> *labs for NCV and others for NATED separately"*

The issue of lecturers not having offices or a place where they can do their daily work seem to be another challenge. The shortage of computers and computer laboratories for students to practice is a challenge on its own. This is a kind of challenge which can be easily resolved. The senior management need to buy more computers One participant stated clearly that they even use their cars to keep their files and other staff because some do not have even shelves to keep their staff. This participant argues that:

> *"Lecturers never had offices. Their cars are their offices because that*
> *is where they keep everything pertaining their daily duties. Their files,*

laptops and students scripts to be marked are always kept on their cars". It's only HOD's and senior lecturers that are having offices. The rest of staff has nothing for daily preparations. They are even using their own personal laptops to do their daily college work. In our campus lecturers neither have offices nor a resource centre. No room or computers available for lecturers to do their daily preparation or marking".

Management view

Responding to the question of management perception, the findings revealed that the college management is aware, concern and working on challenges facing information System students. No one can provide an answer as to why it takes this long to eliminate these challenges. All participants failed to answer this question. The issue remain with the senior management from central office. This is indicated by three different participants who explained:

"We are trying our level best to eliminate all challenges facing Information System students. The problem we are experiencing is that there is a protocol that must be followed which takes long for certain doors to open. It is so unfortunate to know that some staff members including students themselves think that we are doing nothing so solve all problems being experienced by students and staff". (Participant 1)

"We are not yet satisfied with our student's performance, especially in Information Processing but we are working on it. We also understand that this is not an only Information System subject with challenges. Actually we are trying our level best to eliminate all problems associated with Information System and other related subjects". (Participant 2)

> *"We have waited too long for senior manageme6t to resolve such issues and we don't know why it takes this long. We understand very well that computers cannot be bought each year but there must be a period determined by the college senior management of buying computers. Well, computers are very expensive I know but when students are registered their academic needs must be met"* (*Participant 3*)

Participants made it clear that all the stakeholders are aware of the challenges associated with Information System students but nothing positive shown from the side of seniors. They complain that they always report these challenges in vain. It is an unfortunate situation that all management challenges tend to be everybody's challenge. Management challenges affect the whole college operational system, the students, staff and non-lecturing staff.

A number of problems mentioned by various participants, this of Information Processing (IS) was also mentioned by various participants. The findings revealed that within Management Assistant (MA) programme, most students are struggling with Information Processing as a subject. The problem in this subject lies with typing speed which is a real challenge to students with no computing background.

Data gathered and analysed on the theme above made it clear that apart from student's challenges, there are challenges facing management. It is an unfortunate situation that any challenge facing management does have negative outcomes to students themselves. It was also stated by management participants that management is aware of these challenges mentioned above and they are working on them.

4.3.1.2 Theme 2:   Challenges eliminating strategies

It is interesting to know that the management know what to be done in order to eliminate student challenges.

Challenging subjects

One participant mentioned that Information Processing (IP) is among Information System subject in which student not doing well upon. It is clear that the management is aware of it. The College and the DHET need to work together to eliminate these challenges. This is revealed by participants respectively who explain:

> *"The Department of higher education should intervene and ascertain that TVET colleges are well resourced as the minister keep on encouraging students to come to TVET colleges. It is vital for official to ascertain that the quality education is obtainable from TVET colleges to develop trust among students and employers out there. All this can be achieved by coming up with TVET problems eliminating strategies. More computer laboratories are needed so that student gets access to computers even before or after class times."*

> *"The college and DHET must work together and ensure that all academic related challenges are addressed. We can't run away from the fact that most of students who furthering their studies at the college are blacks who come from schools with no ICT infrastructure. Due this fact most of them were not introduced to computers before. To start using and understanding keyboard skills is a challenge on its own. I cannot even start talking about applications related challenges."*

It looks like to add more computers and avail some computer laboratories to students can also eliminate some challenges associated with Information System. The shortage of floor space seems to be a challenge on its own. It is unfortunate that the students do not have computers for practice during their own time. This means their access to college resources is limited and might have impact on their performance.

This is in accordance with the findings revealed by another participant who maintained that:

> *"More computer laboratories are needed so that student gets access to computers even before or after class times. Students need computer centers where they can practice what they learnt on daily basis. These labs must accessible to students at any time of the day".*

To come up with resolution strategies can be the best way of eliminating all challenges students are facing at the college. It is good and interesting to see that the college have some strategies of eliminating the challenges that they are facing which affect teaching and learning and other services.

4.3.1.3 Theme 3:   Support System

Responding to the question of support, the findings revealed that both lecturers and students do get support.

Lecturers support

Lecturers receive support from their seniors and from technicians depending on the nature of support required. The 'open door policy' of senior lecturers gives lecturers freedom to look for support pertaining anything in connection with computer subjects. Lecturers are allowed to communicate with their senior lecturers on matters that relates to subjects they are offering, hardware breakdown, equipment shortage, software related problems and many more. This idea is expressed by participant who explained:

> *"Lecturers do get support via senior lecturers. All subjects have HOD's and senior lecturers. Any support required by lecturers they communicate with their seniors. Seniors also use 'open door policy' where lecturers are free to ask for any support they need."*

Apart from support received by lecturers from seniors, they also get technical support from technicians on matters pertaining technical matters. Here I can mention network problems including printing, software problems like computers failing to boot, log-in problems, programs installation and virus problems. To attend hardware problems like hardware backup and replacements of cartridges is among duties of technicians which are another way of giving lecturers a support. This was expressed by participant who said:

> *"Technicians are there to assist lecturers with technical support. The problem is that one technician is expected to maintain a large number of computer laboratories which makes it difficult for that particular technician to avail himself on the venue where his service is required on that particular time."*
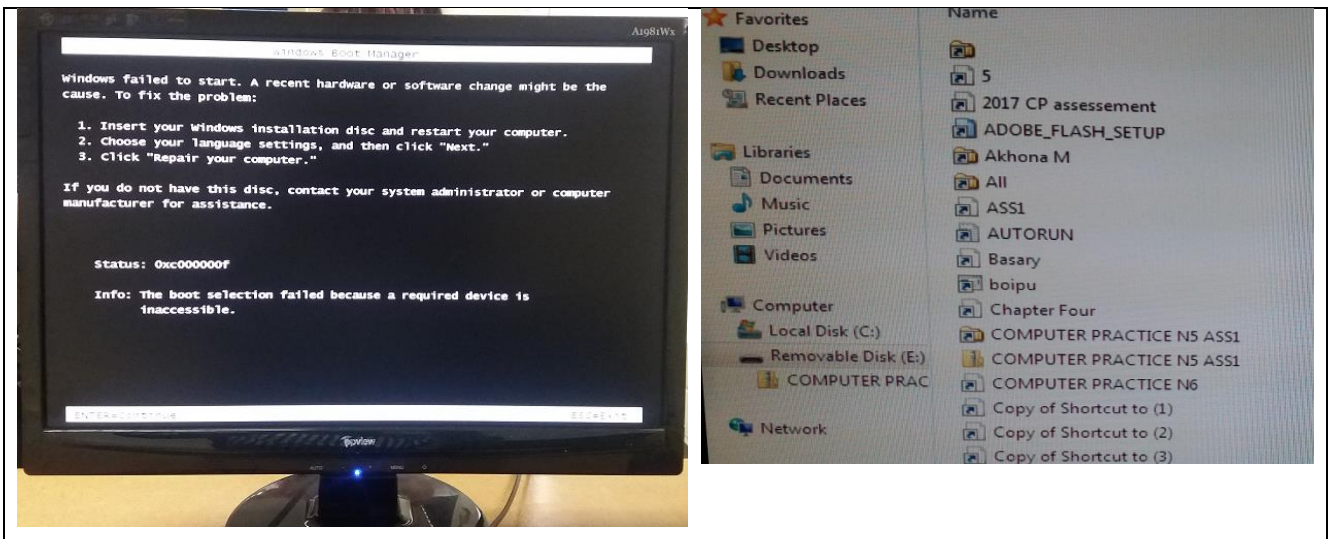
Fig. 4.2 : Software related challenges

As per response from one of participants, software related problems seem to be a serious daily challenge for users. As displayed on the left hand computer above, this computer is failing to boot up, which is an operating system problem. The software that operates the computer might be lost due to novice users or sometimes virus problems. This is among challenges that frustrate students in many cases.

A computer on the right hand side above is experiencing virus problems as all files and folders are converted to a shortcut which is against the will of a user. This problem

is common to numerous computers around all college campuses in almost all computer laboratories. As software, viruses are troubling and challenging all users. The finding of this study made it clear that hardware related problems are not that frustrating. The real frustrating and most common problems of computers are those which are software related.

Students support

Addressing the question of students support, the findings corroborated that:

> *"Some lecturers tend to sacrifice their leisure time to help students on their studies by giving them extra lesson without overtime payments. Not all lecturers are doing that since some are always busy with their studies trying to upgrade themselves. Some staff members' states clearly that they cannot sacrifice their family time on student because the college management is reluctant to pay them over time. Only staff members who are bored use to spend their time at the college without payment. That is something I cannot do. Student Support Services (SSS) is available to assist student with their academic or social problems".*

These findings revealed that students receive support from their lecturers. It was clear that the college does not have student's support system as they claim that Student Support Service (SSS) is available, always up and running. The fact here is that this SSS is there, but mostly to support students with other problems, especially social problems and not academic related ones. The SSS cannot solve any computer related challenges or any academic challenges. It is the college management that need to put a structure that will give required academic support to students.

Coming to the question of computers maintenance, as another way of assisting students, it was highlighted that there is no service provider assigned to maintain computers and all related equipment. Based on data provided by one of participants, it was clear that most of computer problems which include hardware, software and network are always frustrating students and staff because there is no company or the

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so-called service provider to look after these challenges. The participant made mention among other things, the log in and booting problems. These are software related problem and they are the most common ones in all college campuses.

> *"Our computers are not continuously maintained since we never have any service provider to look after our computers. These computers are giving us problems now and again. Login in problems, computers failing to boot and many more problems are the business of the day almost every day. Technicians are always there for computers maintenance. The college use outsource when there is a serious network challenges which cannot be handled by our technicians"*

College software

Data based on additional software used at the college show that there is no additional software at all. Lecturers rely on syllabus specific software only which are Microsoft Office and CFS software. These findings revealed that the college does not buy additional software that might assist student to catch up easily. This data show that the reason for this is nothing but financial issues. The participant also indicated that currently the college is using Microsoft Office 2010 in the year 2017. This alone tells the story that there is a problem when it comes to the purchase of software. Bosley and Moon (2003) stated that inappropriate software is also identified as a challenge in the study conducted by Centre for Guidance Study.

> *"We don't have additional software/ programmes, only a syllabus prescribed software are available. We are using only Microsoft office programmes and Pastel as they are specified by our syllabus. No additional software available. I believe that additional software such Encarta, maths software and other educational software are required but unfortunately there are not there. We don't have budget for additional software as all we have is not even enough for what is required on daily basis in each computer lab. Actually to talk about additional software is a myth because the college use to run all computers with old applications like using Microsoft Office 2010 in the*

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year 2017. As I am talking to you now all our computers in all campuses are running with Microsoft Office 2010".

Based on data provided above it was clear that the issue of buying additional software is away from college management as they are now failing to be in line with Microsoft Office version which forms greatest part of college syllabus. The college technicians have got nothing to do but to keep on installing old versions of applications.

It was also stated that support systems is available to students and staff. These people (students and staff) are core of the college. To make sure that daily business of the college is taken care of, both students and lecturers have a significant daily role to play.

4.3.1.4 Theme 4:   College Resources

Answering the question of resource availability, the findings indicated that resources are available but not adequate and not fully accessible to student during their spare time. Computers, data projectors, printers etc. are all available and can be used by students during class times only.

Resource availability and accessibility

It was the finding of this study that sometimes the same resources are being rotated from one centre to another due to shortages. Marais (2009) argued that the problem of ICT skills shortage among College and university students emanates from the fact that schools have inadequate resources. The researcher believes that inadequate resources Marais referred to involves both equipment and human resource. In some schools computers are there but there is no one trained to teach computer subjects.

> *"Resources are available though they are not adequate and not adequately maintained. In spite of resources availability, they are not sufficient. Some resources are there but not working efficiently while some are totally out of order. Resources like computers, data projectors, printers and copiers are available but continuously moved*

from one venue to another which causes the breakdown of hardware. Resources are there but they keep on giving us technical problems which sometimes the technicians fail to fix".

The data above indicates that student use to go to a certain computer laboratory with an intention of using some equipment like a printer only to find that particular printer is no more; it is moved to another laboratory. Because of such reasons, resource rotation, students find themselves confused and deprived an access to such resources. This is how such peripherals get damaged. Some computer laboratories, like one on picture fig. 4.2 below look promising as they are free from challenges. The truth is each laboratory has its own challenges which results to staff and students confusion. Though it might look promising on pictures below, resource shortage is always frustrating. The literature evaluated on chapter two of this study indicated that the issue of resource shortage, inaccessibility and malfunction is the problem of the universe, meaning it is not a kind of problem which can be associated with Majuba TVET College only. Other institution of learning like schools, colleges and universities, both public and private are experiencing the same resource challenges. In the study conducted by Dlamini (2015), it was outlined that computer rooms of this college are not fully equipped. Dlamini (2015) further outlined that students tend to share a computer during computer lessons, which is another hindering factor for effective earning. Based on data collected from three various campuses, the researcher also concur with an above statement.
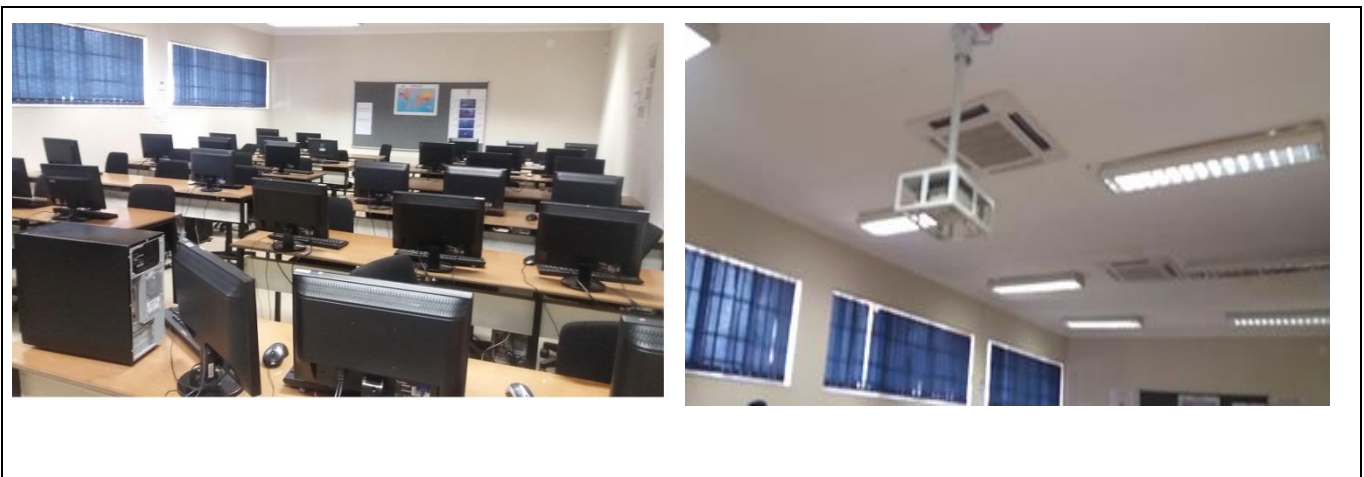
Fig 4.3 Some of computer laboratries

Responding to the question of student access to college resources, the findings revealed that student access is very limited as they can use college resources during the day and during class hours only in the presence of lecturers. Students cannot access computers during weekends or whenever if they need to do their work. It is believed that computer laboratories are always locked and only open during class time to circumvent the problem of hardware theft and breakdown in an absence of lecturers.

> *"Yes, students do get access to resources during the day. During weekends and evenings there is no access. They access college resources at the presence of lecturers only. Computer laboratories are always locked for the safety of hardware and data".*

One participant argued that limited access of student to computer labs in particular has a negative impact on students' performance in Information System as students do not get time they need to do their practice during their spare time. Students come to college with no computer skills and start to use computers for the first time. As a result of this, they need time alone to familiarise themselves with new technology.

> *"I think this is one of the factors contributing on the student's poor performance in Information System. Information System subjects or any computer related skill require more time in front of a computer. In this college student do not get that time since computer labs are accessible only during class hours"*

The issue of resource shortage is a national problem. Bosley and Moon (2003) argued that some schools are using outdated and unsuitable hardware while Preston (2000) found this to be a particular problem for teachers, who complained about out of date resources. New equipment is being introduced almost every day replacing the old one.

Technical support

Responding to the question of technical support, the findings revealed that technical support is there but not sufficient and not all the times. Without good technical support in the classroom and whole-school resources, teachers cannot be expected to overcome the barriers preventing them from using ICT (Lewis, 2003). Is obvious that one technician is facing a volume of work of fixing hardware, software and network problems in a number of computer laboratories as explained by one participant who maintained that:

> *"In my campus there is only one technician looking after more than ten computer laboratories with about 30 computers each. When I visit one of our campuses I use to see two technicians in that campus. In spite of their availability we are always experiencing series of technical problems with our computers and printers. Due to a volume of work facing one technician, some lecturers are able to sort certain problems without involving technicians"*

Response from participant above made it clear that technical problems are not easily solved. The researcher concurs with Butler and Sellbome (2002) who argued that a burnt data projector bulb might take three weeks to be replaced. Technicians use to solve a problem now and the same problems continues the next day. Fortunately some of lecturers do possess some technical skills and can solve certain technical problems without involving technicians.

When it comes to software related issues, it was a concern of all participants that some campuses are operating with software which is not genuine. Some of computers are running with outdated software like old operating system and outdated Microsoft Office. Currently these computers are using Office 2010 instead of Office 2013. Dalton and Smith (2004) expressed their views that the Technical Vocational Education and Training (TVET) curriculum requires continuous renewal and constant involvement of stakeholders in the redesign process. An above statements supports the fact that software upgrade is required in in this field.

> *"There is no software updates. We are always behind technology due to financial constraints. Some computers in other laboratories are working with an Operating System (OS) which is not genuine and we are using such software just to keep the ball rolling"*

It was among the findings of this study that computer equipment is always budgeted for. Now it is bit confusing to find that computers are operating with outdated software due to financial constraints. This outdated software is a challenge on its own as it keeps reminding users about updates by pop up messages on the screen which keeps interrupting users on their work. The college need to attend to this problem by buying new software and ascertain that updatable software is being updated by insuring reliable internet connectivity.

An issue of viruses might be ignored while it frustrates students during their lessons and even during examination times. Removable storages like flash disks are mentioned to be good carriers and also sometimes the victims of viruses. The findings revealed that the college is doing nothing to fight against these problems. Campuses do not have reliable anti-virus software.

> *"Students' removable storage and files are always the victims of viruses because there is no anti- virus software for the college. Technicians cannot install and update anti-virus software to all computers as they are always busy fixing hardware problems. Available anti-virus software is outdated as the student cannot update them due to various technical reasons, which includes internet connectivity."*

A computer virus is software or a program that inters into the computer without a concern and knowledge of a user and does something malicious. (Smith, et al., 2013) This might attack computer RAM, hard drive and cause damage to files or even dislocate operating system from the hard drive in case of boot sector virus. As a result of computer viruses, users lose their important files like their assignments.

It was revealed in this study that college campuses or technicians use to rely on outdated anti-virus software. Sometimes these anti viruses are updateable but cannot due to internet related problems. As stated earlier this issue of virus confuses users. Strange and nuisance messages use to pop-up on the screen while the user is still busy. This is really disturbing and cannot be tolerated by any user.

It was also revealed in this study that different viruses come and go, so it is not an easy task to fight against viruses. Certain type of anti-virus might be installed and only to find that new virus type has come and the current anti-virus cannot fight against. The virus issue is a challenge to both students and staff and is causing lot of frustration. The college must be prepared to spend on anti-virus software each year.

Theme four made it clear that the issue of resources is a problematic one. Resources need to be available and maintained, while students and staff must be given full access to. The findings here revealed that there is no full resource access given to students at the college. The very same resources are not adequately maintained.

4.3.1.5 Theme 5:   Management Role

It is the role of College management to see to it that daily business (teaching and learning) is taking place and is taken care of. This calls for availability of all students and lecturers requirements that will keep the ball rolling.

Information system budget

The findings based on the issue of budget revealed that consumables required by computer subjects like papers for printing, printer cartridges and other equipment are

always budgeted for. Based on the statement above, it reveals that the college is always ready to offer these computer subjects. Howell and Lundall (2000) highlighted the issue of budgeting for ICT. They explained that schools do not budget adequately for maintaining the use of computers. The college do budget for this. This was revealed by participant who outlined:

"Consumables like papers for printing, printer cartridges, air conditioners and other equipment's maintenance consumes lot of money. "

This participant also argued that Information System subjects are a great consumer of the college budget. Software is very expensive and it gets outdated timeously while duplication of hardware due to breakdown also consumes a lot.

"Based on the information from our central office, computers and related equipment like software, duplication of hardware, consumable consumes a large percentage of college budgets each year. "Information System subjects consumes a lot in a budget than other subjects"

Both participants agreed that these subjects consume a great percentage of college budgets. No matter how much is consumed by these subjects, the college should continue offering and availing more money for this because these subjects are required nowadays and they are the core of these campuses.

Service provider

Findings based to question of service provider, the participants stated that there is no permanent or contractual service provider hired by the college. The college relies of technicians employed for computer maintenance and other technical support services. One participant stated:

"There is no service provider for computer maintenance. The college relies on the technicians employed for computer maintenance".

Two participants below stated the following respectively:

"The college is not in partnership with any service provider. There is no service provider available at all."

"Service providers are expensive, the college cannot afford one. Sometimes they send their trainees to solve the college ICT problems and only to find that the trainee is unable to sort out the problem"

On the other hand participant stated that service providers are like insurance companies. One can pay their monthly subscription and face challenges when their service is needed, only to find that they are not giving the service they promised.

"Service providers are like insurance companies. They are very expensive and sometimes they fail to sort your problems when you need an urgent solution".

Hardware and software backup

Responding to the question of software and hardware backups, the findings revealed that there is no hardware duplication at all. They said sometimes it takes a very long time to replace a faulty peripheral like mouse or keyboard or even a printer. This was revealed by data given by one participant who argued:

"No hardware backup at all. We are always experiencing problems of peripherals shortage. When a mouse or keyboard is broken, it can take the entire term or year to be replaced"

On the question of software backup, the college depends on its server. Several sever related challenges have reported.

> *"The college is using its server for software backup. Server is an only instrument we are using for data security; even the confidential one is stored on the server with complicated passwords. Sometimes hardware duplication is available to sort daily hardware problems like shortage peripherals and other things".*

Both hardware and software backup are vital for any organisation. Data is more important than any other thing in an organisation. The entire college relies on the server for data security. The problem here is that the college network is not reliable as it keeps on experiencing challenges even during times of registration which also delays the registration process.

The role to be played by college management seems to be larger and more important than any. The smooth running of the college on daily basis is among management role. It is the college management that is expected to come up with year plan, set the registration processes each term, ascertain that students and staff do get what they need in lecture rooms, manage college budget and ascertain that all machinery functioning efficiently.

4.3.2 Lecturer's Perceptions

4.3.2.1 Theme 1:   Staff challenges

From the lectures perception, series of staff concerns were revealed which hinders effective daily teaching and learning.

College Local Area Network (LAN)

On the question of Local Area Network, it was corroborated that there is a serious challenge with college network. The network used to be out of order in most cases. Lecturers tend to be under pressure when it comes to students assessments. They are anticipated to load files/folders in each computer using removable storage device like compact disks or flash disks because server cannot be accessed due to network problems. This is indicated by one of the participants who explained:

> *"Due to network problems lecturers are anticipated to move from one computer to another, loading files/folder for each particular assessment to be conducted. This is very frustrating to lecturers"*

Fig 4.4: Network challenges in some computer laboratories

Looking at the picture fig. 4.3, it is clear that some of network related challenges results from untidy or improper trunking of network cables. Proper trunking for network cables is important to ascertain that are not disturbed or get disconnected by movement of students in each computer laboratory. What is displayed on the picture

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above is not good at all. On the left hand side of the picture, the network hub is just on top of the system unit with loose cables around. The hub can be easily disconnected or get stolen.

Apart from the issue of loading files in each computer, printing is another problem which is being experienced especially during time of assessments. This challenge is also indicated by the participants who said:

> *"Assessment period is a very challenging one to both students and lecturers due to the fact that some computer venues are always experiencing printing problems, resulting from network problems. Students tend to be moved from one venue to another especially during internal assessments looking for computer laboratory that operates better. This is frustrating and inconveniencing to both lecturers and students."*

Computer subjects

Based on findings from data provided by four different participants, all programmes offered by the college have something to do with computers. In NATED programmes like Business Management (BM), there is Computer Practice as a subject, Management Assistant (MA), there is Computer Practice or sometimes Introductory to Computer Practice and Information Processing, Financial Management (FM), there is Computerised financial System. Even the NCV have computer subjects almost in all programmes which are Life Orientation (LO) and Office Data Processing (ODP).

> *"All programmes offered by the college have something to do with Information System. These programmes are Business Management (BM), Management Assistant (MA), Financial Management and hospitality. Almost all college programmes involve computers or Information System. All college students are using computers almost every day."*

The focus of this study was on NATED students doing Information System, but it was also revealed that all students at the college are using computers as per their syllabus or subjects requirements. This indicates that Information System challenges must be urgently addressed as it affects the college or all students and staff.

Student's assessments

On the question of student's assessments, the findings revealed that most of lecturers offering Information System or related subjects get frustrated during assessments times. The reason for that is nothing but malfunction of computers, printers and network related challenges. Sharing of computer laboratories by two schools, NATED and NCV is a challenge on its own. Actually even students get frustrated during this time. Some groups of students tend to be moved from their normal venues to new venues where equipment is functioning better. This was expressed by two participants respectively.

> *"Assessment period is a very challenging one to both students and lecturers due to the fact that some computer venues are always experiencing printing problems, resulting from network problems. Students tend to be moved from one venue to another especially during internal assessments."*

> *"Due to network problems lectures are anticipated to move from one computer to another, loading files/folder of that particular assessment."*

Other participants (from campus A and campus C) also agreed that running practical assessment is very challenging due to a series of problems they are encountering. It was clear that printing problem is a very serious one. When the printer does not respond after sending work to it, students use to report to lecturer or invigilators. This printing problem emanates either from network problems or malfunction of a printer.

> *"This is very challenging to us as lectures. Sometime the technician will say all computers are working efficiently and they are printing, only*

to find that most of them are not printing while you have already started with assessment."

"It is challenging to conduct practical assessment due to computers and network problems."

It was also clear that sometimes technicians claim that everything in each computer lab is efficient, only to find that challenges arise during assessment time. It was clear that printing and network problems must be attended to. Technical problems among other things is giving lecturers a tough time as students are always there expecting their lecturers to do their best. Lot of staff challenges were mentioned but lecturers are doing their best overcome them through their skills or by asking for help from technicians.

4.3.2.2 Theme 2:   Level of Academic Competency

Level of academic competency among lecturers offering Information System was one of the concerns raised by certain participants.

Qualifications and experience

Responding to the question of lecturers' qualifications and experience, the finding reveals that all lecturers do possess qualifications relevant or required to offer Information System subjects. Qualifications like Information Technology degrees, diplomas, International Computer Driving License (ICDL) and other relevant qualifications have been mentioned. This simply indicates that lecturers are in a position to offer various Information System subjects. Participant's responses also revealed that almost all lecturers have experiences in this field and also have long experience. The following participants mentioned various qualifications:

"I possess a Senior Secondary Teachers Diploma, B.Paed degree, ICDL, Honors degree and I'm currently busy with my master's degree."

"I'm possessing Information technology degree and PGCE. I'm currently working on my master's degree."

Participants also mentioned lot of experience some accumulated from Department of Basic Education (DoE) as the explained:

"I've been teaching Computer Applications Technology (CAT) for 10 years in grade 11 and 12 when I was working for DoE. Here at college I've been teaching Computer Practice for four years now. This is a total of 14 years' experience in the field of computers."

"I've got eight year experience, teaching Information Processing and Introductory to Computer Practice (ICP)."

"I started my lecturing career in Computerized Financial System (CFS) in the past three years."

It seems as if the college employs people with good qualification to offer the subject and the issue of experience is also considered as all lecturers seem to have years of experience. It was also clear that lecturers possess required or relevant qualifications and experience. The issue of student's poor performance in Information System cannot be associated with lecturer's qualifications and their experience.

Few lecturers possess International Computer Driving Licence (ICDL) as per responses from the following participants:

"I am not sure how many lecturers with ICDL."

"There are few but I don't know the number."

"I completed my ICDL in 2007."

"I know nothing about ICDL."

It was a concern from one participant that though lectures possess ICT related qualifications but some of them do not have teaching qualifications. The participant explained that the University of KwaZulu-Natal (UKZN) offered a National Professional Diploma for Vocational lecturers (NPDE). This was offered in order to

advance and develop lecturers' pedagogical skills. Some continued equipping themselves with PGCE from UNISA and from other institutions.

> *"College lectures were not effective teachers because they are not trained for teaching. However, it was also mentioned that the college senior academic managers recognised that pitfall. Hence, in the past few years, initiatives commenced to develop lecturers with pedagogical content and knowledge at the University of KwaZulu-Natal."*

Staff developmental workshops

On the question of developmental workshops, the findings revealed a lack of staff development workshops that might reskill and upskill lecturers. In the past TVET colleges were under the administration of councils, from April 2015 there was a migration process whereby colleges were taken back to the Department of Higher education management. When colleges were under councils there were no developmental workshop which are subject specific. The question is: who must be blamed? Now all TVET colleges were taken back to DHET but yet there are no workshops organised. Another participant believe that under the DHET, changes were expected to be implemented and subject specific workshops to be organised. Up until today there are no developmental workshops.

> *"There is a serious lack of such kind of workshops in this sector. Educators from Basic Education use to attend developmental workshops continuously each year. Here we don't have any"*

> *"When colleges were under councils, no workshops organised I believe something positive is coming with the DHET. The college use to organise short programmes for lecturers like facilitator, assessor and other programmes which has got nothing to do with subjects we are offering. Some of these are offered during holidays which is the*

reason why other lecturers to be unable to attend due to their family commitments"

On the question of subject specific developmental workshops, all participants revealed that such workshops are not organised yet neither by college management nor by the department. Participants indicated that they need such kind of workshops because these workshops serves as platform of improving their knowledge and skills in each subject offered. These workshops need to be subject specific. It is an undisputed fact that technology is improving timeously, so developmental workshops to keep lecturers updated with new ICT skills and knowledge are required.

The findings show that all staff members or Information System lecturers are competent with regards to their qualifications, experience and capability. Despite of the fact that some of lecturers do not possess teaching related qualification but they do possess Information System related qualifications. Some are currently registered with some universities, equipping themselves with relevant skills.

4.3.2.3 Theme 3: Support from the College Management

The finding revealed a lot about technical problems, communication channels like e-mails, challenging fields from various applications and challenging applications.

Technical problems

Responding to the question of computer laboratories with technical problems, the findings revealed that there are laboratories which are dis-functional. Participants indicated that certain computer laboratories are experiencing series of technical problems that could not be solved for quite a long time now. Those labs are declared as venues for teaching and learning on daily basis. Based on information given by participant (Campus B) it was clear that lecturers and students are facing some challenges associated with ICT equipment. This equipment's include computers, printers, data projectors and other devices. Same participant stated that

> *"Some of our computer laboratories I can say are not fully functional due to the series technical problems that cannot be sorted out. It is so*

> *unfortunate that there are lectures and students assigned to use those*
> *labs throughout the term."*

Participant (from campus C) further outlined that series of problems are there on these labs. Network problems, computers not booting and software related problems like viruses are among problems mentioned.

> *"Dis functional labs are even exempted from examinations sessions*
> *due to a number of problems which includes networking, booting*
> *problems, disgusting viruses and many more. Exemption of certain*
> *laboratories is a problem because even examinations tend to be*
> *divided into two sessions instead of one."*

Various lecturers are concern with problems of computer laboratories. One participant (from campus A) stated that as lecturers reports these problems several times to the college management but nothing has been done yet. As lecturers, they are also struggling to excel on their daily work due to these problems. According to participant (form campus C) both college technicians and external technicians have failed completely to sort some of these problems. It is clear that attempts to resolve such problems were unsuccessful. It was also revealed that examination sessions used to be split into two due to computer laboratories that cannot be used for examination. This also calls for long day to invigilators.

> *"I'm also using one of these problematic centers and I raised my*
> *concern about them several times to the management but no solution*
> *yet. To be honest I can say I am not satisfied with the support I get*
> *from college management. The support is no enough, sometime I have*
> *to see what can I do to keep the ball rolling because that is what*
> *students are expecting when they come to lecture room or to the*
> *computer laboratory. I am saying this because it takes too long for*
> *certain computer problems to be attended to or sometimes nothing*
> *comes up."*

Based on data provided by participant above, it is clear that even if lecturers get support from management but it is no enough. The participant also highlighted that

sometimes they don't get the support they are expecting or the support use to be delayed for unknown reasons.

Challenging fields to students

Responding to the question of fields which are challenging in Microsoft Office for students, the findings revealed that almost in all prescribed applications students are encountering various challenging fields in each application. One participant mentioned challenges associated with Microsoft Access or database. Students are struggling to create database queries, reports and printings. The participant stated the following:

> *"In Microsoft Access students are struggling with the creation of queries, reports and the printing of database design or structure."*

On the other hand another participant expressed his concern about the application, students tend to say is simple but when it comes to assessments they don't do well. This application is word processing, or Microsoft Word. Students tend to undermine this application thinking that it is all about typing, bolding, underlining and applying italic only. They really don't understand the advance skills of this application.

> *"Most of student takes MS Word as a simple programme but they don't do well when it comes to formal assessments."*

Another participant (from campus C) indicated that the section of managing files in computers is a challenging one to students. Students are struggling with section since it is one of the sections that used to be done at the beginning of each semester. Based on the findings, students are anticipated to do and understand this section before they can be introduced to any application. The findings further revealed that students are struggling with it.

> *"New students in particular tend to struggle with sections that deal with management of files."*

All participants mentioned different challenging fields in each application that hinders the good performance of students.

Electronic mails

In an attempts to address the question of electronic mails, the findings of this study revealed that most of students do not have electronic mail addresses. Despite the fact that they are in a possession of advance smart phones but it is a limited number of them who are using or communicating with e-mails. Some among students does not even know how to create e-mail addresses while they know how to create profiles on networks such as Facebook, twitter, LinkedIn, Instagram and more. This was stated by participant who outlined:

> *"Most students do not have e-mail addresses as they are even struggling how to create one. There is no time for lecturers to teach that skills because they have a lot to do and they use to focus only on the syllabus".*

Even those students with e-mail addresses are somehow struggling with some skills. It was clear that these students are lacking skills such as attaching a file to an e-mail message. If someone does not know how to attach, it means that person cannot send huge documents, videos files, music files and even pictures. This is among the skills students must be taught.

> *"Those students using e-mails their skills are very limited as some failing to make attachments for large files the need to send".*

It was clear that lecturers are reluctant to deviate from the syllabus because of time. If lecturers can teach skills which are not covered on syllabus, time might be against them and that is main reason why they cannot teach all skills required by outside world. This is an unfortunate situation to students and some also agreed that like an issue of time the syllabus need to be reviewed.

Participants from lecturer's side agreed that they do get support they need but not adequately. It was also clear that like students, lecturers are facing series technical problems on daily basis. The most unfortunate situation is that management is expecting lecturers to produce excellent results while they are not committed on supporting lecturers with daily needs.

4.3.2.4 Theme 4:   Background characteristics

Background characteristics count a lot to lecturer's daily work and to students' academic performance, particularly in this field of computers.

Lecturer-students ratio

Addressing the question of lecturer-students ratio, the findings revealed that each lecturer use to have about thirty students per group irrespective of a subject. Both participants (from campus A and campus B) agreed on that. It was also the findings of this study that as each lecturer have about thirty students per group, each lecturer use to teach four groups per semester. This simply means each lecturer use to have about 120 students per semester and is expected to mark 120 scripts per assessment. About three formal assessments per semester are compulsory. Is that not too much for each lecturer? Hanusek (2003) shown that one cannot conclude, without some doubts, that the reduction in class size improves student performance. Stephens (2007) further outlined that the issue of class sizes and time allocated could be other factors that have a negative impact on student poor performance on computer subject.

> *"Each group/class use to be 25 – 30 students."*

> *"It's plus or minus 30 students per group."*

This indicates that all computer venues are big enough to accommodate such number of students. This also concludes that all computer labs have about thirty computers or more. It was also revealed that some computer laboratories have about thirty computers but sometimes student tend to share a computer due to the fact that some are not in good operation as a result of software related problems or hardware malfunctioning.

Participant (form campus A) stated that a number of students per group use to be determined by a number of students enrolled in each programme. This indicates that each lecturer can have more or less students per group per semester. The same participant indicated that:

"It depends on that particular programme student's enrolment."

All participants indicated that a lecturer-student ratio is thirty students per group which make it clear that each lecturer is teaching plus or minus 120 students per semester which is 240 students per year.

Lecturers ICT qualifications

On the question of lecturers with ICT related qualifications, the findings made it clear that all of them possess some qualification in ICT. It was clear that all lecturers possess the required skills in the field of computing as they meet all the requirements for Information System lecturing posts.

"All lecturers possess some qualification related to ICT."

"Some lecturers have degrees, some diplomas or certificates in ICT."

The findings revealed that student's poor performance has nothing do with lectures qualifications. Lectures do possess required qualifications and skills to offer Information System related subjects.

Information system student's enrolment

Addressing the question of students' enrolment in Information System related subjects, the finding made it clear that all student in three different College campuses, doing different programs have subjects of Information System. This indicates that there are no students whose programme excludes the use of computers.

Participant (from campus C) stated that the campus she is stationed in specializes in IT and business so almost all students in her campus have something to do with computers. The participant said:

> *"This campus specializes in in IT and business, so almost every student in this campus has a subject that involves computers."*

Participant (from three campuses) agreed on that by stating the following:

> *"Almost all programmes here deals with computer usage."*

> *"All our programmes need usage of computers and related equipment".*

> *"All students are using computers for different subjects depending on the programme the student is doing. All our programmes need computers".*

According to participant (from campus B) all programmes such as Management Assistant, Business Management, Financial Management and Hospitality do involve computer subjects. The participant made it clear that there is no programme in this campus which doesn't have computer related subject.

> *"All programmes does have computer subjects, I can mention Management Assistant, Business Management, Financial Management and Hospitality."*

Information System background is of cardinal importance for everyone to do well in any field these days. Such skills are required in all field of economy both nationally and internationally. ICT skills are important for everyone to ascertain that country's economy is taken care of.

4.3.2.5 Theme 5:   Lecturer's Role

As employees of the department of higher education, lectures have their role to play to make sure that teaching and learning run smoothly on daily basis. It is among lecturers role also to ascertain that students are attended; their problems are also given attention. Based on data given below, it shows that lectures do play their role as they cannot push every responsibility to the college management.

"As lecturers, it is our duty or our responsibility to ascertain that normal teaching and learning takes place on daily basis. To ascertain that computers and other devices like printers and data projectors are operating efficiently is part of our responsibility. In our classroom management we manage even the college resources. Safety of all resources in our laboratories is on our hands. We cannot fold arms and say we are experiencing problems. We try our level best to make sure that students are given attention, computers are functioning well and assessments are carried through. It is so unfortunate to state that the management is always expecting us to produce good results at the end of each semester, forgetting that we are always struggling to get support on management side."

Data given here show that lectures are playing their role very well even on difficult situation but to ascertain that students do get what they came to the college for. Everybody has got a role to play as to keep the ball rolling towards right direction.

4.3.3 Students concerns (Focus group interviews findings)

4.3.3.1 Theme 1: Lack of basic skills

Responding to the question of students computing basic skills, the findings revealed that there is a serious lack of such skills. Numerous students start their tertiary studies without even basic skills of computing. Almost all participants agreed on that. Snoeyink and Ertmer (2001) suggested that the first stage of training should focus on basic operations of technology and software applications. One participant (from campus A) stated that most of Information System students are struggling because they lack basic computing skills. This appears to be a challenge to the department of basic education. It indicates that modern technology or ICT related subjects are to be considered in schools.

Poor ICT background

All findings stated below indicate that there is a poor ICT background/ lack of basic computer skills among students which worsen their academic performance in the field of Information System. According to Meiers (2009) young people need to be highly skilled in the use of ICT and there is a growing body of evidence that use of ICT in the classroom can enhance learning. Information System also focuses on techniques like internet, Global positioning Systems(GPS), Bluetooth or other wireless communications, firewalls, Local and international networks

"I came here without even basic skills of computing".

"I think most of us as student we are struggling with Information System because we lack basic computing skills".

"At least now I can even create my e-mail address while I came to this college with no skill in computers"

"I came to the college in February this year not knowing even how to switch the computer on, let alone using mouse and keyboard".

Lack of ICT background goes hand in hand with the lack of basic computing skills. It is clear that students are struggling because they are expected to master both subject content and computing skills in a very short period of about three months. Within this period students are expected to write all informal and formal assessments.

Responding to the question of novice users and problems of ICT background, the findings revealed that a large number of students are struggling with their studies because they are new to computers. Most of them come from poorly resourced schools some from deep rural areas with no electricity. These students do not possess any ICT skills background.

> *"I am a novice user which makes it difficult for me to cope with daily lessons. I use to feel like I'm stupid when I see other students working on their computers while I'm stacked due to the fact that I don't have computer background. Most of us are using computers for the first time here. On my first week it was difficult even to control a pointer on the screen using mouse. I use to spend couple of seconds looking for certain keys in the keyboard which made it difficult for me to complete assessments."*

The findings of this study revealed that a large number of students enrolled at the college are lacking Information System background. The main cause is lack of computer subjects in schools where they come from. The department of basic education (DoE) and school principal need to work together and try to introduce computer related subjects in schools starting from primary schools.

Time allocation

Responding to the question of time allocation, all participants agreed on the fact that time is very short for practical subjects like these of Information System. Fifty five minutes allocated for each period each day is not sufficient for the subject that requires both theory and practice. Policy notional learning time does not simply mean the actual time a learner or student spent in class but it goes beyond that (Dol: 2005). Dol further argued that it encompasses research time, reading time and also practical time. Without practical rooms students are being denied of the privilege of workout

practical components in their notional learning time. Another student participant stated that:

"Each period is 55 minutes per day and one double period per week. This time is good for other subject but is too short for practical subjects like this of computers"

Both participant (from campus B and campus C) also expressed their dissatisfaction to the issue of time allocated for each lesson.

"Sometimes is difficult to complete a lesson in 55 minutes especially if it is a challenging aspect like creation of queries and reports in MS Access"

"These 55 minutes is sufficient if we are learning theory aspects and is too short if it is a practical one"

Lack of basic computing skills among college students appeared to be another course of student's poor performance on Information System. Time allocated for each period daily seem to be too short due to the fact that they need more time daily in front of their computers. The more time they get to use computers, the best they can be. More time need to availed to students to do their own practice as a way of improving students' academic performance.

4.3.3.2 Theme 2:   Access to Computer Laboratories

Addressing the question of students' access to computer laboratories, the findings here revealed that students do not have full access to college resources during their own time. Students can use college resources during class times only. This put them in a serious disadvantage because they cannot study nor do their computer practices in the absence of lecturers. During the weekends the college is not operating and students can be given access to other venues (classes with no computers) to do their studies but not computer venues. The reason for that is the safety of hardware and data stored in each computer laboratories. Two students' participants from one group (from campus A) indicated that:

"That one is a serious challenge for us because we need to practice but we have no access to computer centres. Library with few computers is an only venue we can use to do our practice. Unfortunately the space is very limited there and computers are few."

"We have been told that library is available for us to practice, but the same library has a limited number of computers. The library used to be closed by 4 o'clock or even before while our classes end at 17h30. So we can't rely on it."

Fig 4.5: Limited access of students to resources

The findings here also revealed that the college need to avail one or two computer laboratories for students to practice and do other academic related activities that need computers. This should be done in each campus and those laboratories mustn't be used by lecturers for teaching and learning. Students need to know that they can access those laboratories at any time. People who will be responsible for these laboratories should be employed to take care of these centres and it must not be a lecturer. Such laboratories would be expected to operate long hours and student can utilise them even during weekends. This is one way of giving students an access to resources in order to wipe out technophobia.

The findings also made it clear that even on available resources but student's access is very limited. Shortage of floor space, lack of people who can assist students (tutors) and look after computer laboratories when it is not the teaching time, all appeared to be among reasons limiting student access to resources.

Student's assistance

Responding to the question of technical assistance, the findings revealed that the entire college relies on college employed technicians. Data also revealed that technicians are facing volume of work and sometimes the work use to beyond their control. Technicians also complain about the fact that their job is challenging. The college management does not buy required equipment in time. Lecturers always blame technicians that they are not doing their work on time.

> "We are experiencing series of problems which takes very long to be fixed. *We use to report our technical problems to lecturers; sometimes they assist or ask for assistant from technician. To fix computer problems takes weeks or sometimes months" During assessment times use to experience a lot of technical problems".*

Responding to the question of extra classes, data show that though some lecturers do conduct extra classes sometimes as a way of assisting students by increasing contact time, some they don't. Lecturers also made it explicit that they do not want to conduct extra classes because there are no incentives. These extra classes use to be conducted after hours or during weekends. Some students also need extra classes but lecturers are reluctant.

> *"Some of our lecturers use to organise extra classes for us. Some do not bother themselves with extra classes because they claim that they don't get paid for. Sometimes we even request for extra classes but lecturers are reluctant. The reason of asking for extra classes is to get time to do our computer practice."*

Usage of prescribed textbooks

Most students stated clear that they don't use or rely on prescribed textbooks due to various reasons. Student depends on instructions given by lecturers than reading textbooks. Students made it clear that textbooks are confusing and are using complicated terminology including series of acronyms. The findings also revealed that the College takes long to change the textbooks which lead to the usage of outdated information as the new technology being upgraded.

"Computer textbooks are not easy to understand. They contain a number of acronyms which are not easy to master. The language used there is also complicated. All I can say about textbooks is that they are misleading, it is better to do something practical rather than relying on textbook."

"Textbooks sometimes give a clue of how to go about certain task."

"When I'm using textbook I get more confused."

"Textbooks are confusing, using complicated terminology and acronyms."

The issue of access to computer laboratories or access to resources indicated that access is limited. To use computers or to access computer labs during class times only it not good for students. The findings also revealed that large number of students do not rely on the prescribed textbooks claiming that these textbooks complicate things and some are outdated. It was clear that the college need to keep on changing Information System textbooks continuously as technology keep on changing.

4.3.3.3 Theme 3:   Technophobia as a Hindering Factor

It is clear that fear of technology among students is another problems which contributes negatively to their academic performance. One of the causes of fear is the lack computers or computer subjects from basic schools where students matriculated.

Computer anxiety

Fear being shown or develop on students on their first encounter of computers is hindering their excellent performance. This was stated by one student participant (campus C) who said:

> *"Large numbers of students come from poorly resourced schools where there are no computers at all. They start using computers for the first time here which develops phobia among them "*

Some students use to show fear of breaking hardware or making any harm to computers. People often feel intimidated by subjects like Mathematics and Science and are hence likelier to show computer anxiety (Jacobs, 2013). The researcher concurs with Jacobs as per data provided by some of the participants. This is a result of getting to computers late in their education. This was indicated by the participant from focus group who said:

> *"It takes time for other students to get use to computers due to the fear of breaking hardware or causing any harm to the computer itself."*

Technophobia and being introduced to new technology at the later stage of education are among challenges associated with students' poor academic performance in Information System. This was stated by two student participants (from campus B and campus C) respectively.

> *"Phobia is a serious challenge to us and seemingly a large number of us we start using computers here."*

> *"The school I completed my matric in had no electricity, let alone a single computer."*

The findings based on fear of technology indicated that the department of basic education owes students a lot when it comes to the usage of new technology. It is explicit that numerous schools are still remaining behind with new technology which gives students serious challenge when they reach institutions of higher learning.

Study duration at TVET Colleges

Responding to the question of duration per level all participants indicated that time allocated for each term is too short. When classes starts in February at the beginning

of the year and examination starts in May, that indicates that each semester has only three months and that this is the only time students have to learn and to prepare for their examinations. This is participant argued:

> *"Duration per level I can say is three months. The first semester use start in February each year and in May we start our term one external examinations. The second term start in August and we start exams in mid-October. "*

According to one focus group participant (from campus B), the duration per semester is not supposed to be only three months. Duration per semester should be six months. The participant continued saying much time use to be consumed by registration processes which takes long and reduces teaching and learning time. The participant made it clear that this time is not sufficient at all.

> *"The college use to open in January each year for our first term, but due to long queues and long registration process, classes use to start in February. Same thing happens during the second term, we open in July but star attending classes in August."*

Two participants (from campus B and campus C) agreed on the point that time which is being spent at the college is too short for students to prepare for outside world or for employment. Each student spend three semesters at the college starting from N4, which is the first semester, N5 which is the second one and N6, which is the third semester. The findings reveal that this is about only nine months per semester while the college and the department of higher education claim to be 18 months. In completion of N6 students are expected to go for in-service training of 18 months before they can apply for their diplomas.

> *"Each cause takes three semesters. N4, N5 and N6 followed by in-service training of 18 months to complete a Diploma."*

> *"I think time we spend at the college attending classes is too short which makes it difficult for us to be accurate in computer usage."*

It is with regret to find that participant made it clear that during the time of N6 completion, students are not yet ready or confident to face the world. All participants agreed that time allocated for each semester or time spent by students at the college is very short. The finding also revealed that time allocated for student to complete their qualifications is too short. This might make employers no to believe on TVET Colleges qualifications. Participants agreed that teaching and learning duration need to be extended.

4.3.3.4 Theme 4:   Challenging Fields

Answering questions based on challenging fields, the findings revealed that there are different challenges in Computer Practice, Information System and Computerised Financial System. Various participants came up with various types of challenge. One participant mentioned mail merge, which is among Microsoft Word features as a challenge. On the other hand, another participant (from campus A) mentioned file management section as a challenge.

> *"The section of mail merge in Microsoft word is really hard to understand. This section is always there on assessments. "*

> *"To create folders, subfolders and zipped folders and saving files there is confusing."*

This indicates that almost all students are experiencing various challenging fields on various subjects as these two participants above mentioned challenges associated with Computer Practice (CP) on their curriculum. Participants from two campuses respectively made mention of challenges of Information Processing (IP)

> *"The issue of typing with a high speed in IP is really difficult. I am always failing to finish the question paper whenever I write assessment."*

"IP needs someone who is able to type fast and this is a real problem to us as we started using computers here. We are still struggling with keyboards, trying to find certain keys."

These participants agreed that typing speed gives them tough time. It was clear that most of them are struggling with typing speed since they have started using computers at the college. This also indicates that computer related subjects like Computer Applications Technology are required and needs to be introduced in schools in order to combat this problems being experienced by students when they reach institutions of higher learning.

4.3.3.5 Theme 5: Students Role

The findings here made it clear that lecturers are good platform to student. Every problem students they are encountering, they simply report those problems to the lecturers. This is because of the trust students have on their lecturers. The lecturer can solve the problem or take it to management or even to technicians, depending to the nature of the problem.

"We use to encounter various kinds of problems with our computers almost every day. When we encounter any problem with our computers, we simply take the matter to the lecturer concern. As students we tend to face series of various problems at the college, but here I am referring to computer related subjects whereby our computers give us problems that we cannot solve"

Student's role is nothing other than getting their lecture rooms, do their work and report any computer problems to their lectures. By so saying we mean students do play certain role as well because they use to identify some computer problems, take those problems to their respective lecturers for solutions.

The findings revealed that the following are some of the factors leading to students' poor performance in Information System:

- Lack of confidence
- Lack of resources
- Limited access to resources
- Computer anxiety
- Lack of technical support
- Malfunction of hardware and software
- Network problems
- Lack of basic computing skills
- Lack of training
- Technophobia
- Negative attitude towards computers
- Issue of time
- ICT background
- Financial matters
- Student accommodation problems
- Poor ICT infrastructure
- Human resource problems
- Virus problems
- Time allocation

Challenges revealed by recent literature with regards to Information System indicated that the above are challenges of the universe.

4.4 Summary

Chapter four was based on data collection and the way it was analysed. Different types of tables were used to analyse the collected data. Semi-structured interviews were used to collect data from relevant participants while audio recording and notes taking were also utilised.   Data collected about both college management and lecturer's perception was analysed. Coding system using tables with categories, descriptions and codes was used.

It must be stated that the scope of questions is widened, meaning more questions came in due to responses received from participants. Question pertaining budgets, software issues, networks, workshops, lecturer student ratio, technophobia and many more became part of interviews in this study. This interview transcript was also audio recorded by the researcher. Coding system was used to analyse these interviews.

CHAPTER FIVE

FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 INTRODUCTION

In this study data was collected, processed and recommendations were provided. Information and Communications Technology has become an important part of most organisation and business these days (Zhang & Aikman, 2007) . More studies based on Information System/ICT need to be conducted as to promote the culture of using Information System which will improve our lifestyle and our economy at large. One cannot argue that Information System is part of today's daily lives. It is used in schools, businesses, households or in almost all organisations today. This new technology offers numerous means of improving students' academic performance not only in Information System subjects but in education at large. The recommendations and finding of this study needs immediate implementation to start eliminating student's negativity on ICT. Conclusions, limitations and recommendations of the study were discussed in this chapter.

5.2   AN OVERVIEW OF THE STUDY

In chapter One, the study was introduced with a provision the background, as well as the rationale behind the research, the problem statement, the aims and objectives, and the scope of the research was given. Chapter one introduction gave a motivation as to why the study was undertaken. Details about NATED Information System student's poor performance were offered.

Chapter Two presented extensive review of an existing literature, concerning challenges facing students in respect of Information System/ computer subject performance. Theoretical framework used in this study was Rogers "*Diffusion of innovation*". Diffusion of innovation is defined as a theory that seeks to explain how, why and at what rate new ideas and technology spread. Rogers (2003) argues that diffusion is the process by which an innovation is communicated over time among participants. The reason of incorporating this theory in this study was because tertiary institutions students in particular are anticipated to come up with new ideas in

Information System, adopt and let others adopt these ideas. In this chapter, lot of literature based on Information System or ICT were consulted.

Chapter Three presented research methodology. This incorporates the research design, sample size, sampling techniques, data collection instruments, data presentation and analysis of this study. College campus manages, HOD's, lecturers and students in a form of focus groups from three college campuses were sampled. Purposive sampling was used to collect data from selected participants. Ormrod (2005: 145) pointed out that purposive sampling involves the selection of individuals who are in a position to provide sufficient information on the topic being discussed. This sampling assisted the researcher to derive in-depth knowledge through semi-interviews from relevant participants.

Chapter Four dealt with data presentation/ interpretation and analyses and the findings were discussed at the later stage in this chapter. This was done by presenting the description of the sites or campuses of Majuba TVET College.

Chapter Five presented an overview of the entire dissertation. The main study findings, recommendations, limitations and conclusion of the study followed.

5.3 MAIN FINDINGS

The findings of this study were drawn from semi-structured interviews conducted. These interviews involved campus managers, head of departments (HOD) of Information system within three campuses of Majuba College, lectures offering Information system and student focus groups. Findings were also drawn from literature review and Rogers's diffusion of innovation theoretical framework.

5.3.1 Student background

Based on findings of the study, it was revealed that a large number of students studying at Majuba College are coming from poor resourced schools with serious lack of ICT infrastructure. Even those who are doing Information System and other ICT related subjects at Majuba are the victims of this situation. Blame cannot be put on students but to schools management teams (SMT's) and the department of basic education. Today one cannot divorce education from Information System. Even a graduate without computer skills today his/her qualification is nothing. Almost all organisation and businesses today are using computers and other modern technology devices and techniques. Software/applications are being developed and upgraded time to time. Without understanding of all these terminology, techniques and devices, one cannot cope in business, health or in education. The findings revealed that students start their tertiary education without even basic skills of computing.

Some of these students claim that there were computers in schools where they come from and there was no educator who can teach them even basic computing skills. Those computers ended up lying there with no one taking care of and most of them end up stripped. Components like hard drives, Random Access Memory (RAM) removed, motherboards damaged, Digital Versatile Disks (DVD) and Compact Disks (CD) drives stolen. What the department of basic education doing about this? Information System needs to be part of curriculum in teacher training these days since we cannot take computers away from education. It is a duty of all education stakeholders to ascertain that Information System plays a vital role in education.

It is another challenge that the very same students who are now expected to excel on their ICT studies come from technologically disempowered communities. The college enrolled a number of rural students who come from remote areas where there is no electricity at all. Even those who come from electrified rural, the use of modern technology is still a dream. In those areas a school child cannot even get Information System assistance from any member of a community. Those communities do not take care of modern technology but they believe on manual doings as they come from old school.

Let alone the fact that there are no computers on their schools, these students do not have access to computers at all as they do not have one even on their respective homes. Some are in a possession of smartphones and tablets but the fact is that they don't even know how to use them as they use them to make calls and send SMS's only. One cannot argue that computer skills are incorporated to these smartphones and tablets but due to the lack of computer skills, they cannot use them effectively.

One prominent variable in the environment and physical investment is class size. A better higher education environment is correlated with small classrooms. Angrist and Lavy (2004) conducted an experiment to test the class size and student performance. On the other hand, Hanusek (2003) had already shown that one cannot conclude, without some doubts, that the reduction in class size improves student performance. The issue of class sizes and time allocated could be other factors that have a negative impact on student poor performance on computer subjects (Stephens, 2007).

Looking at the link between ICT and student performance seems nowadays a misunderstanding of the role and nature of these technologies. In fact, since ICT is general purpose technology, it needs to be specified in order to meet the needs expressed by students and to be adapted to the local context and constraints (Youssef, 2008).

5.3.2   Technophobia

Technophobia was revealed as a caused of general anxiety or fear about science or mathematical problems. People often feel intimidated by these subjects and are hence likelier to show computer anxiety (Jacobs, 2013). As stated above, most have a fear of certain subjects like Mathematics and Physical Science which is possible that they extend this phobia to computers. Knowledge is the best way of overcoming this fear. Individuals suffering from this phobia must be willing to share ideas, information and knowledge by first admitting to their phobia (Salmon, 2015). In the study conducted by (Wilson, 2006) students show lack of computer skills. Wilson (2006) continues stating that the education testing service is conducting studies that could reveal lack of "information literacy" among college and high school students. It is so unfortunate that this is not only a problem facing students, but it is common even to educators and principals.

Some educators are reluctant to accept the use of modern technology in their classrooms. The main cause of this is nothing, but the fear of technology. They believe that modern technology will consume their duties and expose their emptiness in the use of computers. They are also conservative, saying new technology use in the classroom is time consuming and it need much time to prepare for the lesson. Some say the problem of load shedding can disturb their lesson so it's better to continue using old system of teaching. Some do not want to equip themselves with new kills of technology claiming that they are old and they cannot start learning new things now. This notion of teachers experiencing a fear of ICT is also supported by Russell and Bradley (1997), who refer to a 'cyberphobia' that exists in some teachers which can be a genuine concern for them, and that these concerns deserve serious attention.

5.3.3 College and ICT resources

The findings of this study revealed that there is a serious lack of computer related resources at Majuba College. This problem is common to all Majuba College campuses. Here the researcher can mention resources like computers, printers, data projectors, overhead projectors, removable storages, relevant software including anti-virus software. Limited floor space and shortage of computer venues were identified as a big a challenge. After a lesson has been conducted, students have no access to computer venues to practice the newly acquired computing skills as a way of learning.

In one of the campuses of the college which is ITB, there are two schools which are NCV and NATED students. Due to the lack of floor space, some students, particularly doing NCV starts their lessons in the morning while NATED students start their classes at 12h30 in the midday.

Commencement of lessons in the midday is a challenge on its own. Both students and lectures seem to be exhausted during this time of the day but yet they are expected to do their best. The reason of starting lesson at this time of the day is to give each other a floor space allowance. Most of NATED students especially those doing Information System are disadvantaged because they finish their lessons very late and no time for them to use college resources for their own practice. It is of cardinal importance for students to learn on their own after the lessons were presented as a way of assessing themselves before they go for any formal assessment. This is impossible with Majuba College because there are no freely available computer venues for students to do this.

In Information System lessons students tend to share computers because some of these computers are problematic, damaged or are out of order. This is a real challenge because when assessment comes, no student will share a computer as this is not allowed at all. Each and every student must do his/her own work on his/her own computer. Hardware duplication needs to be considered. Most of students complained about this, saying the college management seem to do nothing about this problem. When internal assessments are conducted this tend to be a hectic time to lecturers offering Information System and related subjects because it becomes their duty, not the management duty to strategize and see how they will conduct these assessments because some of these computer venues are totally dis-functional.

Some of college courses are semester courses. A semester starts at the beginning of the year around February and end in the mid-year in May or June. Another one starts in July or August and ends in November. This is a very short time for students to learn and lecturers to teach. Each semester takes only three months and this is a very short time for lecturers to teach and develop basic computing skills to someone who had never use a computer before. Within these three months, internal and external assessments are inclusive.

Lack of technical support also makes matters worse. The college use outdated resources like computer textbooks and software. The college is failing dismally to keep updated with new technology. Job done by lecturers is hectic. Lectures are expected to go extra miles in preparation of any assessment, moving from one computer to another in order to load files for assessments. This is because of Local Area Network (LAN) technical problem. Lecturers should load assessment files to the server and let all students access it on a network. But this is not possible with Majuba College. What a college management is doing about this? Because of all this technical problems, teaching and learning time is drastically reduced as lectures are anticipated to go extra miles before going to lecture rooms.

The college has a number of Information System subjects and numerous students doing these subjects while the college lack resources.

5.3.4 Financial matters

Back to basic education department, some school principals do not want to boarder themselves with Information System on their schools as they believe that it will consume the entire school budget. Is the same notion common to Majuba College? No ways, the college offers a number of computer subjects, so sufficient budget must be made available for Information System and all its related requirements including the consumables like printer cartridges and printing papers. These consumables are extremely expensive but they are required for college daily business. Computers and other equipment keeps on braking time and again and funds should be located on buying hardware for backups. Software, starting from Operating Systems gets outdated from time to time. Computer viruses keeps on causing chaos on daily bases as students tend to use and share removable storage devices like memory sticks and compact diskettes (CD). On the other hand internet is consuming the world with all types of computer viruses.

The Gauteng Department of Education stated that the following are matters that need to be considered by schools on maintaining the use of ICT in schools:

- Ongoing running expenses, including
    - Maintenance

- ▪ Technical support
- ▪ Printing and consumables
- ▪ Connectivity
- Insurance
- Software and hardware
- A school website
- Staff development

5.3.5 Poor ICT Infrastructure

ICT infrastructure to cater for all Information System and other daily businesses of the college is not up to standard. This makes it difficult for the college to cater for student's needs. As the issue of resources has been addressed, student use to wait on long queues for registration which takes about three days or more to complete. They also travel long distances to the college just to check their results. This indicates a poor infrastructure because in some institutions of higher learning, students use to register online and also access their results the same way. This is possible on institutions with good and up to standard infrastructure. These long queues also consume teaching and learning time which is also limited.

According to certain participants, Wi-Fi was installed at college campuses recently. This was a good move by the college so that students and staff can connect to internet using their own devices like smart phones and laptops. Unfortunately the technique never worked efficiently as it keeps connecting slowly and sometimes failing completely to connect. Even in classrooms or in computer laboratories, internet connectivity is faced with series of challenges emanating from college Local Area network (LAN) and continues to internet. It looks like there is no maintenance team employed by the college to make sure that everything is in order.

5.3.6 Human Resource problems

It is the finding of this study that certain lecturers offering Information System subjects lack experience in this field. Some do not have required level of qualification to offer these subjects. Some are taken from their field of specialisation to ICT when there is a shortage of people with required specialisation. Lecturers are moved from one field

to another based on requirements and enrolment of students in each term. This act has a negative output to student's performance in the field of Information System. Some lecturers are leaving the college due to various reasons among them salary dissatisfaction. It is so unfortunate that in most cases the college is losing qualified and experienced lecturers in this field. The novice inexperience lecturer will be employed just to keep student occupied.

Lecturers are demotivated due to the lack of incentives and dissatisfying salaries. In the year 2015, TVET Colleges were taken back to DHET from councils. This migration process was so negative to College employees especially lecturers because their salaries were drastically reduced. Some their housing allowances were taken away altogether.

5.3.7 Study Duration

The College programmes duration is 18 months of studying time plus another 18 months for in-service training which makes a total duration of three years for student to complete his/her Diploma. The total duration for each term is only three months. It is not an easy task for Information System students to grab and understand everything is such a very short time. Some of these students are doing their first year especially N4 who are using computers for the very first time. To master the new computing skills and be able to sit for examination in such a short time is really challenging. The researcher also considered that most of these students are from Matric/basic education. So it is really hard for them to be in line with new college system of short semesters.

Number of participants indicated that it is also hard for college students to get the relevant in-service training in a way that some end up getting into irrelevant in-service training. Some don't even manage to complete their first Diploma. There is an accumulation of series problems around this issue. When students are done with studies and in-service training, are also expected to apply for their diploma which takes very long for the DHET to release their qualification. Some ends up with no qualifications while they met all the requirements. The college together with DHET need to re-evaluate this. It looks like there is a serious lack of support from DHET yet students are encouraged to opt for TVET colleges to further their studies.

The college semester system divides a year into two. First semester starts in January to June of each year. The second semester starts from July to December. It is an unfortunate experience to see that students have only three months to study per semester. First semester classes use to commence in February in each year and ends in May when external examinations starts. Second semester classes commence in August and ends in October. This is very short time for students to learn and to prepare for their internal and external assessments. It is more challenging on the field of Information System; especially the N4 students who are expected learn computer skills in such a very short period, most of them they have never used a computer before. Let alone time used to be consumed by weekends and students unrest. This is the reason why an in-service training time should be reduced and increase contact time to two full years. Two years contact time and one year in-service training does qualify a student his/her National Diploma.

5.3.8 Students' accommodation

Majuba TVET College students reside on their private rental residence which makes it difficult for them to do computer practices using college resources. The very same students do not have computers on their residence. The findings also revealed that this is a challenge on its own as students use to face difficulties of accommodation. Majuba College does not provide accommodation for students irrespective of their home towns. Most of them come from distant areas. Some students do not attend regularly as they sometimes claim not to have transport fare as they are accommodated away from college campuses.

On other institutions of higher learning where students have accommodation within the premises, students do well. The reason for this is that students don't spend time on travelling every morning and afternoon. They don't get stressed by transport fares and late arrival to the institution. Instead, students have more time for their studies. They are always together, sharing ideas and helping each other on various subjects they are doing. College resources are always available to them. Computer centres and libraries are open for them.

It is recommended that the College provide students with accommodation by constructing new building or the college buys properties, such as houses and flats built around campuses. Instead of spending money and time on travel expenses, students can pay for accommodation within or around college campuses. This can avail more time for them to study and get full access to college resources even after hours. This is one way of improving their academic performance especially in Information System.

It was also the finding of this study that unavailability of student's accommodation within college premises is a serious challenge which contributes negatively to their studies. On the private accommodation five students or more tend to share a single room. This is caused by serious shortage of accommodation. In such a situation students are struggling to do their academic work silently since in some household they are 35 or 40 students accommodated. There is no space to study, no required resources and they also victims of crime in the area. Students failing to pay their rent in time they easily get fired. All these aspect confuses them and make them not to do well on their studies.

Some students tend to be chased out by municipality, saying their landlords do not meet the accommodation specified requirements. In another scenario, about 37 students were accommodated in one household with only six rooms and sharing only one toilet. Some ends up living or car garages due to the shortage of space. According to local municipality, this is totally not allowed and unacceptable.

5.3.9 Students ICT Skills

It is incredible how much ICT knowledge and skills college students possess. The challenge is that these ICT skills are being used unprofitable. They spend much of their time on the so-called social networks. The researcher looks on them as anti-social networks. Students spend their precious time on networks such as Facebook, Twitter, LinkedIn, What's up, and many more. These students use to display advanced skills in these networks. It is so unfortunate that these networks do not contribute positively on their Information System college results or on their academic performance at large. The very same students cannot even create e-mail addresses for themselves as they spend time on fruitless and helpless communications. The ICT refers to the hardware, software, networks and media for the collection, storage, processing, transmission and presentation of information (voice, data, text, images), as well as related services (Evoh, 2007:1).

Students can create new accounts on these networks, upload and download whatever they want such as pictures, videos and music, update their profiles, and even create groups. These students don't do well on their Information System academic performance. They tend to fail these subjects dismally. Students need to understand that today's economy is based on Information System. Actually Information System is a pillar of economy in the whole world.

5.4   Recommendations

Recommendations should follow the same logical flow as the findings and interpretations; presenting each around the major theme or results of testing in the same order (Creswell, 2004). It is highly recommended that teacher training be re-evaluated. Information system should be the backbone of teacher training in any institution that produces teachers. One cannot argue that almost all school subjects today use Information System and all subject content can be simplified through modern technology.

 All teachers today even the experienced ones should attend ICT training sessions in order to equip, upskill and reskill themselves. School principals from basic education need to encourage and allow staff to attend ICT developmental workshops. The department of basic education should make funds available for teacher's skills development particularly for information System training and that can improve matric results at large. Student proceeding to tertiary institutions will be equipped with such skills at early stage.   Well ICT equipped educators can equip their high school learners so that they can cope with their studies when they start their tertiary education.

It is also recommended that educators and even lecturers register and possess an International Computer Driving Licence (ICDL) certificate. ICDL is offered world-wide and is called European Computer Driving Licence (ECDL) for Europeans and ICDL for non-Europeans and comprise of the following modules:

- Computer essentials
- Word processing
- Spreadsheets
- Presentation
- Databases
- Internet and e-mail

Someone who is in a possession of such certificate, employers know that person have the required skills to carry out the main computer tasks. ICDL is a short programme equipping people with the required computer skills and is offered by various educational institutions world-wide and is internationally recognised.

The department of basic education must see to it that computer related subjects, such as Computer Applications Technology (CAT) and Information Technology (IT) are introduced to all schools starting from primary level. Students tend to develop technophobia if they start using computers at higher learning institutions. This is the very same challenge identified by researcher at Majuba TVET College. Students who are more victimised by this are those coming from schools, doing their first year at college. ICT infrastructure must be made available and be maintained in each school. All educators, irrespective of subjects they are offering should go for training how to use computers and other ICT related equipment and techniques. The reason for that is that all subjects today can be taught by using modern technology. Principals need to see to it that their schools and staff are equipped with relevant Information System skills. Such trainings will develop their staff confidence in ICT.

Parents need to know that buying a computer for a child at the early age is not a waste of money. Those who can afford must do so at early stage of child's education. It is totally unbelievable to see a college student who cannot even launch or type in Microsoft Word application, let alone creating an electronic mail (e-mail) for himself/herself. Lecturers use to spend time teaching the first year students basic computing skills such as mouse and keyboard skills. This consumes a lot of time which makes it difficult to do well in any computer related subject. These are the skills need to be taught at primary school level.

It was also recommended that the study duration at the college be increased from 18 months to full two years and in-service duration be reduced to one year. This still makes duration of three full years for students to complete their Diploma but contact time is increased. Reducing in-service period will give students more contact time in class to learn more, develop more skills and get used to Information System practice.

An idea of student tablet and teacher tablet introduced by the minister of education in Gauteng, Mr. Lusufi is highly commended. The use of electronic boards as oppose to chalkboard, with health risk is also encouraged. This is one way of encouraging the use of ICT in the education system of South Africa. It is one of the recommendations of this study that other eight provinces in the country should follow a good initiative by minister Lusufi in Gauteng. A national "teacher laptop policy" which was envisaged must be put into practice as a way of upskilling educators. The

DoE owe students and educators a real change. A change that will simplify both educators' and students work. A good example of changes in work practices is in schools in the United States that have introduced laptops for all students and have trained teachers to organize teaching around students' doing all their written assignments on their laptops. This system, introduced by Net Schools specifically changes teacher and student work, with the purpose of improving the academic performance of at risk students (Carnoy, 2004).

Based on literatures, it is explicit that some school principals believe that computers consume the entire school budget because hardware and software and consumables are extremely expensive. Based on the above statement it is also recommended that schools also budget for computers. Howell and Lundall (2000: 47) highlighted the issue of budgeting for ICT. They explained that schools do not budget adequately for maintaining the use of computers.

It is the recommendation of this study that the college avail one or two computer laboratories for students to practice and do other academic related activities that need computers. This should be done in each campus and those laboratories mustn't be used by lecturers for teaching and learning. Students need to know that they can access those laboratories at any time. Person who will be responsible for these laboratories should be employed to take care of these centres and it must not be a lecturer. Such laboratories would be expected to operate long hours and student can utilise them even during weekends. This is one way of giving students an access to resources in order to wipe out technophobia.

It also recommended that developmental workshop seminars for lecturers offering Information System and technology related subjects should be continuously organised in order to upskill, reskill and keep them updated with new skills of technology.

5.5   Recommendations for further research

Based on this study findings and limitations, it is suggested that the following need further investigation:

- The study was limited to one TVET college. The research need to be expanded to other colleges nation-wide.

- Education stakeholders need to check and see if that the kind of Information System offered in TVET Colleges is a quality one.

- Studies integrating Information System with other subjects need to be conducted.

- The study was TVET College limited, further research is needed that will look on integration between Information System offered by DHET and DoE.

5.6   Limitations of the study

There are numerous factors limiting the study which the researcher has no control over them. Those factors are considered as limitation of the study. Here are some of the limitations of this study.

- Limited or lack of knowledge among certain participants was a hindering factor in this study.

- Other limiting factor was the lack of confidence among some participants. Lack of confidence among participants regarding Information System knowledge and skills became serious hindering factor.

- Time was too limited while data need to be collected from a number of participants and from various Majuba TVET campuses. This study was conducted in a very specified and limited time frame. This had a negative impact on the outcomes/ findings of the study.

- Research was limited to Majuba TVET College only, out of about 50 TVET Colleges county-wide.

- Limited number of recent studies conducted under this field was another challenge to this study. Most of studies related to this were outdated as most of them were 10 or even 15 years old. Providing evidence from recent literature was a challenge. Available literatures looked at barriers and uses of ICT, with some emphasis on the use of computers (Scrimshaw, 2004).

- College withdrawal of funding while the study was on was another limiting and frustrating factor.

5.6   Entire Study Discussion

The study conducted was qualitative in nature, a sample of campus managers; Head of Departments from Majuba College, lecturers and students focus groups were used. "Qualitative studies are best at contributing to a greater understanding of perceptions, attitudes, and processes" (Glesne, 2006) Through these literatures and semi-structured interviews conducted, a lot has been revealed based on perception of students, lecturers and management about Information System. Researches and surveys were conducted about ICT and students challenges. It was also clear that both Department of Basic Education and Department of Higher education still owe students a lot in as far as Information System is concern.

The first objective of this study was to identify the challenges experienced by NATED Information System students. To assess the perceptions of the NATED Information system lecturers and that of College management were second and third objectives respectively. The findings revealed that both lecturers and management of the College are aware of challenges facing students in this field. Responses from various participants made it clear that these challenges are there and the college is working upon.

Various literature used in this study confirm the findings. Some of the factors that contributed negatively are said to be the factors facing the field of ICT worldwide. The findings from both literature and participants stated among other factors, the lack of confidence, lack of resources, computer anxiety, lack of technical support, malfunction of hardware and software, network problems, lack of basic computing skills, lack of training, technophobia, negative attitude towards computers, issue of time, lack of ICT background, financial matters, student accommodation problems, poor ICT infrastructure and human resource problems.

A number of participants mentioned that these challenges were there and even today there is no solution the College came up with. Other participants also stated that it is a senior management which seem to ignore these challenges because they keep on reporting them. Participants also highlighted that the campus management use to take matters to the senior management, but the senior management is doing nothing; instead they keep on promising that they will address those challenges. To explore

strategies that can be implemented to eliminate the challenges faced by NATED Information System students was the fourth objective. It was among the findings of this study that there certain things to be done to eliminate some challenges.

The minister of higher education use to tell students that they must consider TVET Colleges after matric to further their studies rather than flocking in numbers to universities. Unfortunately TVET Colleges, Majuba College inclusive are facing series of challenges starting from that of infrastructure. This study revealed a number of challenges facing TVET sector. The findings of this study revealed that a mixture of National Accredited Technical Education Diploma (NATED) and National Certificate Vocational (NCV) students is one campus is among the challenges that lead to serious shortage of space and resources.

The department of basic education need to ascertain that Information System subjects are introduced to learners while they are in schools in order to bridge the gap that exists among students. Morden technology needs to be part syllabus from primary to high schools. This alone can solve some problems facing students when they get to higher institutions of learning. Universities that produce educators need to make sure that Information System is part of educator training.

The literature accessed in this study revealed that Information System challenges being experienced by students in higher learning institutions emanates from schools where students come from. Information System or related subjects are being ignored or not available at all in schools. Educators employed by the department of basic education seriously lack ICT skills which affects their students in a very negative way. The literature also revealed that the problem lies with principals who fears computers. Due to the fear they have or the tendency of computers consuming the entire school budget, the principals simply turn a blind eye on these subject. Actually principals are the ones who are anticipated to introduce Information System subjects as per the need of the world we are living in.

5.7   Conclusion

In this study the researcher strived to get solutions that might improve Majuba TVET students' performance in computer subjects/information System. This was a way of reducing both failure rate and fear of ICT. Through this accomplishment, accessing information among student was encouraged not only the one based on computers but for their education as required.

The findings of this study were an eye opener to Majuba TVET College management and lectures or brought solutions and recommendations to the problem being experienced by their students. Students' performance in Information System might be improved as a result of this study. Certain recommended measures might be the results of this study might be utilised by College management to improve the entire student results. In other words this study set out a vision to Majuba TVET college management and lectures offering Information System.

This study was conducted to be an eye opener, not merely to other people but also to the researcher himself. Actually there is a large outcry in South Africa based on students not doing well on computer subjects. Educators/ lecturers need to be instrumental in this field. They must possess required computing skills and knowledge as a way of setting good trend for their students. It is a limitation also to involve lecturers as participants, teaching computer subjects while it is not their field of specialisation, some without even teaching methods/qualification.

Acronyms

ICT	Information and Communications Technology
IT	Information Technology
IS	Information System
TVET	Technical Vocational Education and Training
CP	Computer Practice
ICP	Introductory to Computer Practice
ODP	Office Data Processing
CFS	Computerised Financial System
IP	Information Processing
DHET	Department of Higher Education and Training
DoE	Department of Education
NCV	National Certificate Vocational
UNESCO	United Nations Educational, Scientific and Cultural Organization
CPD	Centre for People's Development
ITB	Information Technology and Business
CD	Compact Disk
DVD	Digital Versatile Disk
LAN	Local Area Network
RAM	Random Access Memory
CMOS	Complementary Metal Oxide-Semi Conductor
SMT	School Management Team
GDE	Gauteng Department of Education
HOD	Head of Department
NQF	National Qualifications Framework
CEDU	College of Education
CAT	Computer Applications Technology
PC	Personal Computer
ICDL	International Computer Driving Licence
ECDL	European Computer Driving Licence
QDA	Qualitative Data Analysis
NATED	National Accredited Technical Education Diploma

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APPENDIX A

Proof of registration

UNISA | university of south africa

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1138

        MBAMBO G P MR                           STUDENT NUMBER : 5401-936-2
        P O BOX 18206
        OSIZWENI                                ENQUIRIES  TEL : 0861670411
        2952                                                FAX : (012)429-4150
                                                eMAIL : mandd@unisa.ac.za

                                                2016-08-19


Dear Student

I hereby confirm that you have been registered for the current academic year as rollows:

Proposed Qualification:    MED (EDUC MANAGEMENT)        (98405)

                                                                   PROVISIONAL EXAMINATION
     CODE       PAPER    S NAME OF STUDY UNIT              NQF crdts  LANG.  EXAM.DATE   CENTRE(PLACE)
     ----       -------  - ---------------------           --------- -----  ----------- ---------------
Study units registered without formal exams:
     DFEDU95             M ED - EDUCATION MANAGEMENT          96       E

You are referred to the "MyRegistration" brochure regarding fees that are forfeited on cancellation of any study units.



     CREDIT BALANCE ON STUDY ACCOUNT:      10.00-


Yours faithfully,


Prof G Zide
Registrar                                        0108 O 00 0
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APPENDIX B

Application form for students to conduct research in public colleges

higher education
& training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

DHET 004: APPENDIX 1:

APPLICATION FORM FOR STUDENTS TO CONDUCT RESEARCH IN PUBLIC COLLEGES

1. APPLICANT INFORMATION

1.1.	Title (Dr /Mr /Mrs /Ms)	MR	
1.2	Name and surname	GOODWILL PHEZULU MBAMBO	
1.3	Postal address	P.O. BOX 18206, OSIZWENI 2952	
1.4	Contact details	Tel: 034 318 1206	
		Cell: 078 303 3964	
		Fax: N/A	
		Email: mbambogp@yahoo.com	
1.5	Name of institution where enrolled	UNISA	
1.6	Field of study	EDUCATIONAL MANAGEMENT	
1.7	Qualification registered for:	Please tick relevant option:	
		Under-graduate Degree	
		Honours Degree	
		Master's Degree	✓
		Doctoral Degree (PhD)	

2. DETAILS OF THE STUDY

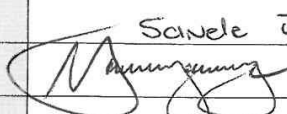| 2.1	Title of the study
	CHALLENGES ENCOUNTERED BY NATED INFORMATION SYSTEM STUDENTS AT MAJUBA TVET COLLEGE, NEWCASTLLE

APPENDIX C

Permission letter from the department

DHET 004: APPENDIX 1: APPLICATION FORM FOR STUDENTS TO CONDUCT RESEARCH IN PUBLIC COLLEGES

FOR OFFICIAL USE

DECISION BY HEAD OF INSTITUTION

Please tick relevant decision and provide conditions/reasons where applicable	
Decision	**Please tick relevant option**
1	Application approved	✓
2	Application approved subject to certain conditions. *Specify conditions below.*	
3	Application not approved. *Provide reasons for non-approval below.*	

NAME AND SURNAME:	Sanele J. Mlotshwa
SIGNATURE:	
DATE:	18/08/2016

MAJUBA TVET COLLEGE
CENTRAL OFFICE

1 8 AUG 2016

TEL: 034 - 326 4888
PRIVATE BAG X6602
NEWCASTLE 2940

5

APPENDIX D

Interview guide for management members of Majuba TVET College

QUALITATIVE RESEARCH INTERVIEW SCHEDULE			
Research Title	Challenges encountered by NATED Information System students at Majuba TVET College, Newcastle.		
Organisation:	Majuba TVET College	**Address:**	83 Allen Street Newcastle 2940
Researcher:	Goodwill Phezulu Mbambo	**Supervisor:**	Dr. T Netshitangani (UNISA)
Purpose:	To find out what are the stakeholders' perceptions of the challenges encountered by NATED Information System students at Majuba TVET College.		
Deadline:	February 2017	**Interview Date**	

1. How many computers related subjects are being offered in this campus?

2. How many students doing computer subjects?

3. What are the challenges you are facing in as far as offering of computer subjects is concern?

4. What are the challenges facing students in as far as offering of computer subjects is concern?

5. How is the students' performance in computer students?

6. Are your computers operating well in all computer laboratories?

7. What support you give to both lecturers and students for computer subjects?

8. What are the challenges do you encounter as management in offering computer subjects?

9. Do the college have other ICT related resources like printers, scanners and data projectors, in each computer laboratory?

10. Is the lecture time for each period on daily basis enough?

11. Do students have access to college resources during their own time or during weekends?

12. Which service provider is helping you with computer technical support?

13. In as far as Information System is concern, do you think it is beneficial for students to do these subjects? How and why?

14. What do you think the college can do to simplify the way the college is offering computer subjects?

15. What is your perception in as far as offering of computer subjects is concern?

16. Do you have any other comments that you would like to make?

APPENDIX E

Interview guide for lecturers offering Information System/ Computer subjects

QUALITATIVE RESEARCH INTERVIEW SCHEDULE			
Research Title	Challenges encountered by NATED Information System students at Majuba TVET College, Newcastle.		
Organisation:	Majuba TVET College	**Address:**	83 Allen Street Newcastle 2940
Researcher:	Goodwill Phezulu Mbambo	**Supervisor:**	Dr. T Netshitangani (UNISA)
Purpose:	To find out what are the stakeholders' perceptions of the challenges encountered by NATED Information System students at Majuba TVET College.		
Deadline:	February 2017	**Interview Date**	

1. How many computers related subjects are you offering?

2. As an Information System lecturer, which subjects and levels are you teaching?

3. Do you have students who are doing using computers for the first time?

4. How do those students cope?

5. Are your computers operating well in all computer laboratories? If not, what are the challenges?

6. What are your views with regard to the provision of computer subjects in this college?

7. Can you mention some challenges encountered by students in using computers for the first time?

8. Do you get all the support you need as a lecturer to offer your computer subjects?

9. Is the lecture time for each period on daily basis enough?

10. Do you manage to use college resources during your own time to plan and prepare you lessons?

11. What would you like to change if you are empowered, in connection the way computer subjects are offered?

12. In as far as Information System is concern, do you think it is beneficial for students to do these subjects? How and why?

13. What do you think the college can do to simplify the way computer subjects are offered?

14. What is your perception in as far as offering of computer subjects is concern?

15. Do you have any other comments that you would like to make?

APPENDIX F

Interview guide for students – Focus group

QUALITATIVE RESEARCH INTERVIEW SCHEDULE			
Research Title	Challenges encountered by NATED Information System students at Majuba TVET College, Newcastle.		
Organisation:	Majuba TVET College	**Address:**	83 Allen Street Newcastle 2940
Researcher:	Goodwill Phezulu Mbambo	**Supervisor:**	Dr. T Netshitangani (UNISA)
Purpose:	To find out what are the stakeholders' perceptions of the challenges encountered by NATED Information System students at Majuba TVET College.		
Deadline:	February 2017	**Interview Date**	

1. How many computers related subjects are you currently doing?
2. As NATED student, what level are you in?
3. Have you ever use/ learn about computers before coming to this college?
4. Are your computers operating well in all computer laboratories?
5. What are your views with regard to the provision of computer subjects in this college?
6. What are the challenges do you encounter as students in using computers for the first time?
7. What about other computer subject related devices like printers and data projectors, are they available and working efficiently?
8. Is the lecture time for each period on daily basis enough?
9. Do you manage to use college resources during your own time to do your computer practices?
10. What would you like to change if you are empowered, in connection the way computer subjects are offered?
11. In as far as Information System is concern, do you think it is beneficial for students to do these subjects? How and why?
12. What are your views on the college management's role on the provision of Information System?
13. What do you think the college can do to simplify the way computer subjects are offered?

14. Do you have any other comments that you would like to make?

APPENDIX G

Letter requesting campus managers, HOD's, and lecturers to participate in an interview

Dear ………………

This letter is an invitation to consider participating in a study I, G.P. Mbambo, am conducting as part of my research as a master's student entitled "Challenges encountered by NATED Information System students at Majuba TVET college, Newcastle." at the University of South Africa. Permission for the study has been given by Department of Education and the Ethics Committee of the College of Education, UNISA. I have purposefully identified you as a possible participant because of your valuable experience and expertise related to my research topic.

I would like to provide you with more information about this project and what your involvement would entail if you should agree to take part. Challenges associated with students' failure to cope with new technology are in rural enormous. Sharing information regarding students who are struggling with Information System can be used to improve the performance of TVET students in this era where South Africa is prioritising TVET education.

Your participation in this study is voluntary. It will involve an interview of approximately 30 minutes in length to take place in a mutually agreed upon location at a time convenient to you. You may decline to answer any of the interview questions if you so wish. Furthermore, you may decide to withdraw from this study at any time without any negative consequences.

With your kind permission, the interview will be audio-recorded to facilitate collection of accurate information and later transcribed for analysis. Shortly after the transcription has been completed, I will send you a copy of the transcript to give you an opportunity to confirm the accuracy of our conversation and to add or to clarify any points. All information you provide is considered completely confidential. Your name will not appear in any publication resulting from this study and any identifying information will be omitted from the report. However, with your permission, anonymous quotations may be used. With your permission the interviews will be digitally recorded. Data collected during this study will be retained on a password protected computer for **5 years** in my locked office. There are no known or anticipated risks to you as a participant in this study.

If you have any questions regarding this study, or would like additional information to assist you in reaching a decision about participation, please contact me at +27 78 303 3964 or by e-mail at mbambogp@yahoo.com.

I look forward to speaking with you very much and thank you in advance for your assistance in this project. If you accept my invitation to participate, I will request you to sign the consent form which follows.

Yours sincerely

G.P Mbambo

****

APPENDIX H

Focus group/ interview assent and confidentiality agreement for students

I_____ grant consent/assent that the information I share during the group discussions (focus group interviews) may be used by the researcher, G.P. Mbambo, for research purposes. I am aware that the group discussions will be digitally recorded and grant consent/assent for these recordings, provided that my privacy will be protected. I undertake not to divulge any information that is shared in the group discussions to any person outside the group in order to maintain confidentiality.

Participant's Name (Please print):

Participant Signature:

Researcher's Name: G.P Mbambo

Researcher's Signature:

Date:

APPENDIX I

Participant information sheet for staff

_____/_____/2016

Dear Prospective Participant

My name is Goodwill P. Mbambo and I am doing research with Dr. T. Netshitangani, a senior lecturer in the Department of Educational Leadership and Management towards M-Ed (EM) degree at the University of South Africa. We have funding from Majuba TVET College for conducting the research. I am inviting you to participate in a study entitled Challenges encountered by NATED Information System students at Majuba TVET College, Newcastle.

WHAT IS THE PURPOSE OF THE STUDY?

I am conducting this research on student's challenges in connection with their computer subjects, trying to find out why they are struggling with Information System at large.

You were considered to be the participant because as Campus managers, HOD's, and Lecturers at Majuba TVET College you interact with the students on daily basis. As lecturers you assess them and are likely to know what their challenges are.

WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

You are requested to share your information and experiences regarding the challenges you are facing with Information System.

This might be help to improve the usage of computers and to get good results in Information System. This interview will only take approximately 30 minutes of your time. Researcher will take notes and voice-record the interview for transcription.

CAN I WITHDRAW FROM THIS STUDY EVEN AFTER HAVING AGREED TO PARTICIPATE?

Participating in this study is voluntary and you are under no obligation to consent to participation. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

The scientific community could benefit from your participation, and will as such contribute to the existing field of knowledge in educational research.

ARE THERE ANY NEGATIVE CONSEQUENCES FOR ME IF I PARTICIPATE IN THE RESEARCH PROJECT?

The only anticipated level of discomfort or inconvenience to you might be the 30 minutes of your time. No foreseeable risk of harm or side-effects to you as interviewee is anticipated at this stage. The interview could preferably take place in your normal place of work and as such in surroundings that are familiar to you.

WILL THE INFORMATION THAT I CONVEY TO THE RESEARCHER AND MY IDENTITY BE KEPT CONFIDENTIAL?

You will be interviewed on a basis of confidentiality and as such, no mention of your name or that of any other person should be made in order for it not to appear on the recording. If a name slips through however during the voice recording, it will not be included in the written transcription of the interview.

You have the right to insist that your name will not be recorded anywhere and that no one, apart from the researcher and identified members of the research team, will know about your involvement in this research OR your name will not be recorded anywhere and no one will be able to connect you to the answers you give. Your answers will be given a code number or a pseudonym and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference.

Apart from the researcher and the supervisor, only the transcriber and/ or external coder will have access to the data. These persons are also subjected to confidentiality agreements.

Your answers may be reviewed by people responsible for making sure that research is done properly, including the transcriber, external coder, and members of the Research Ethics Review Committee. Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

However, the anonymous data you furnish may be used for other purposes, such as a research report, journal articles and/or conference proceedings. If your name is not mentioned anywhere in the research data, the chances are virtually nil for someone to attach data to you as the interviewee. In this regard you are requested not to disclose personally sensitive information at al.

HOW WILL THE RESEARCHER(S) PROTECT THE SECURITY OF DATA?

Hard copies of your answers will be stored by the researcher for a period of five years in a locked safe at researcher`s place of residence for future research or academic purposes; electronic information will be stored on a digital storage device ("flash drive") and also kept in the same safe. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. If the data is not used in future, the hard copy will be destroyed by shredding and then burning. The digital storage device will be formatted in order to destroy all information on it.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

No payment will be made or incentives provided prior, during or after the interview. The interview is done on a basis of objective data collection. Any incentives might adversely affect the giving of unbiased information.

HAS THE STUDY RECEIVED ETHICS APPROVAL?

This study has received written approval from the Research Ethics Review Committee of the College of Education, UNISA. A copy of the approval letter can be obtained from the researcher if you so wish.

HOW WILL I BE INFORMED OF THE FINDINGS/RESULTS OF THE RESEARCH?

If you would like to be informed of the final research findings, please contact GP Mbambo on +27 78 303 3964 or by e-mail at mbambogp@yahoo.com.   The findings are accessible for five years.

Should you require any further information or want to contact the researcher about any aspect of this study, please contact GP Mbambo on the abovementioned phone or e-mail address.

Should you have concerns about the way in which the research has been conducted, you may contact Dr. T. Netshitangani, at e-mail: netsht1@unisa.ac.za, office telephone +27 12 429 4261 or fax +27 12 594 6046.

Thank you for taking time to read this information sheet and for participating in this study.
Thank you.

_____

G.P. Mbambo

APPENDIX J

Participant information sheet for students

_____/_____/2016

Dear Prospective Participant

My name is G.P Mbambo and I am doing research with Dr. T. Netshitangani, a senior lecturer in the Department of Educational Leadership and Management towards M-Ed (EM) degree at the University of South Africa. We have funding from Majuba TVET College for conducting the research. I am inviting you to participate in a study entitled "Challenges encountered by NATED Information System students at Majuba TVET College, Newcastle".

WHAT IS THE PURPOSE OF THE STUDY?

I am conducting this research on student's challenges in connection with their computer subjects, trying to find out why they are struggling with Information System at large.

WHY AM I BEING INVITED TO PARTICIPATE?

You were considered to be the participant because you are a doing NATED Information System students at Majuba TVET college.

WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

You are requested to share your information and experiences regarding the challenges you are facing with Information System.

This might be help to improve the usage of computers and to get good results in Information System. This interview will only take approximately 30 minutes of your time. Researcher will take notes and voice-record the interview for transcription.

CAN I WITHDRAW FROM THIS STUDY EVEN AFTER HAVING AGREED TO PARTICIPATE?

Participating in this study is voluntary and you are under no obligation to consent to participation.   If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

The scientific community could benefit from your participation, and will as such contribute to the existing field of knowledge in educational research.

ARE THERE ANY NEGATIVE CONSEQUENCES FOR ME IF I PARTICIPATE IN THE RESEARCH PROJECT?

The only anticipated level of discomfort or inconvenience to you might be the 30 minutes of your time. No foreseeable risk of harm or side-effects to you as interviewee is anticipated at this stage. The interview could preferably take place in your normal place of work and as such in surroundings that are familiar to you.

WILL THE INFORMATION THAT I CONVEY TO THE RESEARCHER AND MY IDENTITY BE KEPT CONFIDENTIAL?

You will be interviewed on a basis of confidentiality and as such, no mention of your name or that of any other person should be made in order for it not to appear on the recording. If a name slips through however during the voice recording, it will not be included in the written transcription of the interview.

You have the right to insist that your name will not be recorded anywhere and that no one, apart from the researcher and identified members of the research team, will know about your involvement in this research OR your name will not be recorded anywhere and no one will be able to connect you to the answers you give. Your answers will be given a code number or a pseudonym and you will be referred to in this way in the data, any publications, or other research reporting methods such as conference.

Apart from the researcher and the supervisor, only the transcriber and/ or external coder will have access to the data. These persons are also subjected to confidentiality agreements.

Your answers may be reviewed by people responsible for making sure that research is done properly, including the transcriber, external coder, and members of the Research Ethics Review Committee. Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

However, the anonymous data you furnish may be used for other purposes, such as a research report, journal articles and/or conference proceedings. If your name is not mentioned anywhere in the research data, the chances are virtually nil for someone to attach data to you as the interviewee. In this regard you are requested not to disclose personally sensitive information at al.

HOW WILL THE RESEARCHER(S) PROTECT THE SECURITY OF DATA?

Hard copies of your answers will be stored by the researcher for a period of five years in a locked safe at researcher`s place of residence for future research or academic purposes; electronic information will be stored on a digital storage device ("flash drive") and also kept in the same safe. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. If the data is not used in future, the hard copy will be destroyed by shredding and then burning. The digital storage device will be formatted in order to destroy all information on it.

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HOW WILL I BE INFORMED OF THE FINDINGS/RESULTS OF THE RESEARCH?

If you would like to be informed of the final research findings, please contact GP Mbambo on +27 78 303 3964 or by e-mail at mbambogp@yahoo.com.   The findings are accessible for five years.

Should you require any further information or want to contact the researcher about any aspect of this study, please contact GP Mbambo on the abovementioned phone or e-mail address.

Should you have concerns about the way in which the research has been conducted, you may contact Dr. T. Netshitangani, at e-mail: netsht1@unisa.ac.za, office telephone +27 12 429 4261 or fax +27 12 594 6046.

Thank you for taking time to read this information sheet and for participating in this study.

Thank you.

_____

G.P. Mbambo