

**The application of computer technology in teaching technical subject: A
case study comprising of educators at a Further Education and Training
(FET) College in Durban.**

By

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Abstract

Many claims have been made in the literature about the motivational effects of Information and Communication Technologies (ICT) on learners, leading them to have a positive perception towards their work, spend longer periods on tasks and be more committed to their learning. The author of the present study has utilized their previous research evidence of motivation and the results of other previous projects to investigate the factors which motivate educators to use ICT. This project was initiated to investigate the educator's perception, which has contributed to the continued use of ICT, by educators experienced in using it for teaching. The evidence discussed in this paper was collected through a literature search, educator documents, educators' reports or observations and interviews. Weiner's analysis of motivation research and cognitivists theories of reasoned action and planned behaviour have been used as a basis for the analysis of the results.

Research findings show that the motivational factors which correlated most positively with the use of ICT were: perceived ability to use Information Technology (IT); level of resources available and their satisfaction with IT; and whether using IT in teaching is considered to be interesting, valuable and enjoyable. The most significant negative factor was difficulties experienced in using IT. Researcher also found that a whole range of other perception factors attributed by the educators to using ICT. Such as: making the lessons more interesting for the educator, increasing learners' motivation, improving presentation of materials, making the teaching more enjoyable, improving the content of the lesson, and making the lessons more fun for the learners, were considered by the educator respondents to contribute to the learners' progress in learning.

DEDICATION

To my late mother-

To you *Nomona Ntombika-Bhobho*

I know you would appreciate what I have accomplished.

Secondly, I would like to thank my wife, Nomsa, for her support and sacrifice, and my twins (son and daughter) Philani and Siyaphila for their patience during my long hours of occupation with the writing of this dissertation.

DECLARATION

I, Sibuko Sydney Cele, declare that this dissertation is my own work, and has not been submitted previously for any degree in any university.

.....
Signature by Researcher: Sibuko S. Cele

.....
Date

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CHAPTER ONE

INTRODUCTIONARY

1.1 Introduction

Information technology is increasingly becoming an integral part of our everyday lives. The business world embraced technology and has utilized it as a tool since the inception of the personal computer some 25 years ago. Our South Africa Technical education system has been much slower to adopt technology. The need to integrate computers into our technical colleges is obvious. If we want our students to obtain the knowledge and skills necessary and expect them to participate in a technologically advanced, world we need to plan for the proper integration of information technology into the curriculum (Hazzan, 2000).

The increased awareness is timely, given that information technology is already impacting educators and its effects is forcing a re-training of educators in teaching and learning in an “information age” and “knowledge society.” In order to make effective use of educational technology, educators will have to **perceive** it **positively**. They will be able to master a variety of powerful tools, redesign their lesson plans around technology-enhanced resources solve the logistical problem of how to teach a class full of students with a smaller number of computers, and take on a complex new role in the technology-transformed classroom (President’s Committee of Advisors on Science and Technology, 1997).

According to Weber, (1996), there are positive and negative perceptions, the researcher believes that information technology will inevitably integrate fully with technical education. This can be a wonderful experience, if curriculum shifts more towards a student-centered

perspective educators learn the information technology and its uses properly and students are actively engaged in its uses daily as they would with a textbook. The researcher believes he can do his part by taking it upon himself to learn as much about information technology and its uses in the classroom, while the researcher is training to become a positive perception educator, so he can be the best educator that he can be for his students. That's why the researcher has the statement of purpose as follows:

1.2 Problem Statement

The primary aim of the study is to investigate how educators use computer technology to teach technical subjects in a "Further Education and Training (FET) College"

1.3 Critical Questions

- What are the perceptions of educator towards the use of information technology in teaching technical subjects at "Simo Samandosi (SS) FET College"?
- How do the educators use information technology in teaching technical subjects at "Simo Samandosi (SS) FET College"?

1.4 Rationale

The merger of Technical colleges to become FET Colleges, as was instructed by the former National Minister of Education (Kader Asmal) brought some challenges within the merger. The merger was meant to combine the previously disadvantaged colleges and those that were supported by the previous regime of the apartheid government. Three technical colleges combined SS FET College as one of the biggest merger in KwaZulu/Natal, which was known as A, B and C, brought some challenges. One of the main challenges in the merger is the use of information technology in the technical subjects as a learning resource. According to the Provincial Minister of Education (Cronje, 2004) of KwaZulu/Natal there is a need for information technology in the FET College to be used in technical subjects. We have to use the information technology in teaching and learning, to bridge the gap between the constructed world and real world. Therefore, as part of the merger, the researcher was instructed by Counsel to investigate and then prepare a document with steps and recommendations that would help in the implementation of a new information technology policy for the new institutions. The document would also be useful in the implementation of information technology policy at FET Colleges nationally.

However, the SS FET College has a vision to be the “Pioneering Centre of Excellence, serving the social-economic needs of a diverse community, with world-class education and training, leading to lifelong learning”. In order to be a pioneer, you need to use high-tech as a part of teaching and learning. Today one of the most powerful high-tech resources is information technology in teaching and learning. Therefore, the college needs to be more positive, and pro-active in the implementation of information technology. With this study the college will be able to identify how they can achieve their vision with the use of information

technology. The study also finds the strength and the weaknesses of the college towards achieving their vision of lifelong learning by the implementation of information technology in technical subjects.

SS FET College was given a task by Provincial Minister of education in KwaZulu/Natal Province (Cronje, 2004), to introduce a “Training Academy”. The training academy was introduced to assist in the training of government employees in the use of information technology as part of their daily duties in their offices. In the opening speech of the Minister of Education (Cronje, 2004) at SS FET College, she emphasized the need for training of the government employees by the training academy. With this kind of qualification and training, the government can easily fast track the delivery of service to the community of KwaZulu/Natal Province. Especially with the use of new information technology by the employees the working conditions and output will improve. There is a need for the department to train their employees to meet the demands and needs of the community that they serve. The resources should be of a high standard so that the level of training in the training academy can be high. The training done in the training academy is supported by government education department therefore the department will save on the cost of training the employees that is normally charged by private service providers. Therefore, the study aims to illustrate the expediency of the training academy for the training of employees of the government.

FET College educators’ perception is still not clear in terms of the purpose of this training academy. Because of that, the Minister of Education in KwaZulu/Natal has instructed the college to come up with a policy that will guide the training academy. Since perception is so powerful, another reason for this study is to try to establish a college policy that will

contribute toward the establishment of the new provincial and national policy in terms of implementation of information technology as part of teaching and learning resources. Therefore, this study will determine the educator's perception towards training. The most important element in the implementation of the information technology is educator.

Educators from the FET Colleges are struggling with the implementation of information technology, yet the demand from the industries is still overwhelming them. The characteristics of a post-industrial society demand that graduates of vocational programme gain the knowledge and skills necessary to apply higher-order skills and to demonstrate sophisticated technical skills in the workplace. As a result, prospective educators must attain the knowledge and skills necessary to employ a wide range of sound instructional methods to engage students in the learning process, to integrate vocational and computer concepts, to coordinate classroom and work-based learning, and to articulate secondary and postsecondary programme. The study aims to make the Counsel understand different factors that may affect the use of information technology like perception. If the educators from the FET College have a negative perception of the use of information technology, it will lead to the neglect of information technology as teaching and learning resources.

Educators are trying to overcome this kind of situation, but are still unsuccessful. It has been identified that one of the many problems that have to be investigated is educators' perception. The Counsel of SS FET College identified this. The researcher, as a concerned citizen, was tasked by the SS FET College Counsel to investigate and see if perception has an influence on the use of information technology, because at the moment, it seems as if there is still a huge problem in the implementation of information technology in the technical

subjects. Therefore, although this is one of the reasons for conducting the study, the main aim is to investigate the educator's perception.

There are different types of perception in the human nature, but the study is focusing on negative and positive perception towards the use of information technology in technical subjects. According to Prosser & Trigwell, (1999) when individual perception of educator is positive, then to the other educators perception should be positive. Therefore, the study will help the educators who are positive to merge with other educators so that the organisation can move towards the use of information technology in technical education subjects. The study also helps the educators with a positive perception to utilise their strength to build positive attitudes in the college towards the use of information technology in their teaching and learning environment.

The negative perception of educators can lead to division in the organisation. The researchers Prosser & Trigwell, (1999) find that educators who have a negative perception of individualisation can cause negativism in an organisation. Such negative perception can have a devastating effect on the use of information technology in an organisation. The study will assist the college to identify the impact of the negative perception in an organisation and enable it to solve the problem of implementation of information technology in technical subjects.

Piek & Mahlangu (1990) used an experiment that determined that the experience of the educators towards the use of information technology/computer can cause a positive perception. Perception is motivated by the indeterminacy of experience and our perceptual skills serve to make determinable objects sufficiently determinate for us to get an optimal

grip on them. Moreover, educators wouldn't want to evolve beyond the tendency of our bodies to move so as to get a grip on the world since this tendency is what leads us to organise our experience into the experience of stable objects in the first place. Without our constant sense of the uncertainty and instability of our world and our constant moving to overcome it, we would have no stable world at all (Piek & Mahlangu, 1990). Therefore, the study will help to determine that experience in the use information technology; which can lead to positive perception towards the use of information technology in teaching technical subjects.

Perception always depends on previous experience (Child, 1993). Therefore, it is essential to start from a point in the presentation of material, which enables the pupil to call on previous experience (advance organizers). Understanding, rather than rote learning is important in the formation of clear perception and is more likely to assist in long-term memory. Perception is our awareness of the world and its contents through sensory experience. The analysis of perception and the attempt to deal with skeptical arguments about perception knowledge are central philosophical topics. Perception involves both our capacity to be sensorily affected by external objects and our ability to bring these objects of perception related to us and to physical objects is matters of continuing concern. It is clear that if the educators from FET College do not transformed their perception to that of a positive one, it will be difficult for them to use information technology in teaching technical subjects. The study assisted the educators with steps and procedures that they can implement to transformed their perception to the extent that it takes the organisation in the right direction.

Galligan (1997) emphasizes the role of individual educators in the implementation of information technology and how educators can affect the educational appropriateness of

information technology: It is their [educators'] choices of how, when, where, why and by whom computer technologies are used that determine whether or not the technological pull is educationally beneficial. Although information technology availability is important, the most important factors determining whether educators use computers effectively are planning time and educator perceptions, style and background. Therefore, one of the aims of this study is to recommend the steps that should be followed by the FET educators in order to control their perception in terms of using information technology in teaching technical subjects.

The South African government has targeted FET colleges for learnership programmes to develop competence and skilled persons for industries. A high standard of using information technology in FET College should be compatible with the global market of industry. The idea of technical skills is that they can improve the unemployment rate in South Africa and uplift the economy of the country (Cronje, 2004). Therefore, another reason for conducting this study is to compile a document that will help both educators and companies in terms of information technology implementation as part of any training that FET Colleges are offering to those employees or learners. Such documents give guidelines to the employees, employers and educators in the use of information technology as a part of training and learning.

Different companies that are involved in learnership schemes are using FET Colleges. Those companies are expecting the FET Colleges to use a combination of both low-tech and high-tech in training and teaching their employees (as learners). It is important that FET College educators should use information technology as part of their teaching and learning resources. The study aims to find the educators perception and compare it with the needs of the companies. Therefore, if the educators use low technology while the industries require high

technology then the study would try to help them upgrade the standard of teaching and learning through recommendations.

Some educators have been attending training programmes in countries like Canada, Chicago, India, UK and others. Unfortunately, the training programmes were not successful because they were unable to use information technology. In short, they need information technology training in order to be successful in the training programme. However, they not want to attend any local computer-training programme that may help them to acquire some basic information technology skill. Although they use information technology in some of the subjects, it seems as if they do not enjoy it. Therefore, the study aims to explore their perception and tries to help them to become positive towards the use of information technology in teaching technical subjects. Without this study, it would be difficult for the educators to continue with the training programme that they have been attending in other developed countries.

Around the globe, in both developed and developing countries information technology in education has become a very important aspect. In an era of information technology educators can face the challenges of information technology only by making necessary provision for technology education. This study is aim to assist South Africa to develop like other developed countries that use information technology in teaching and learning.

The successful use of information technology in the classroom depends on the educators' perceptions towards information technology (Lawton & Gerschner, 1982). Gressard and Loyd (1985) found that the perceived usefulness of information technology can influence perceptions towards information technology, and the amount of confidence an educator

possesses in using information technology may influence his or her implementation in the classroom. Educators' perceptions have not been emphasized in the implementation of information technology into the technical subjects, though studies stated that educators' perceptions as well as knowledge and skills in using information technology are major factors affecting their initial acceptance of information technology and their future behaviour regarding computer usage (Violato, Mariniz & Hunter, 1989; Koohang, 1989). The developed countries are using information technology as one of their basic teaching and training resources. The study will help the college to become a pioneer in education; all educators should be able to use information technology in their teaching and learning.

The study has empowered the researcher in terms of understanding different kinds of perception that influence the use of information technology in education. The researcher has understood the terminologies that are used in information technology and how to use information technology effectively in education.

1.5 Review of related literature:

To elaborate the contextual meaning of perception, especially to the human being, the researcher would start with the fact that educators also have a perception towards the use of information technology in teaching technical subject. Their perception can be positive or negative, but it may influence the use of information technology in technical education.

The energy causing reaction or sensation in the sense organ is called stimulus. Being aware of sensation involves more than the functioning of the relevant sense organ and it automatically triggers perception. "Perception can be defined as the (main cognitive) process that accompanies the stimulation of one or more sense organs and which allows one to receive and process information from the environment" (Bedeck & Plug, 1993). Meaning that, perception enables one to live in harmony with other people surroundings him/her. Perception is necessary for self-preservation, for which we need to be aware of what is going on around us, so that we can take necessary action to avoid danger; our senses also provide pleasure, such as the perception of scent, sound, etc and so increase our welfare (Lowe, 1995).

Information Communication Technology (ICT) training staff often assume that because their own attention is focused on the right aspects of the presentation, their students must be focusing on the same aspects. It is best to test this **assumption and to make corrections** when necessary. ICT training staff usually concentrates on the aspects of information technology that they are more comfortable with, without using the whole program of information technology thus leading educators to have to have a negative perception towards it. The perception of each individual or social group is influenced by a number of factors:

knowledge, experience, social environment and personality. The precise nature of the influence these factors have varies with each individual or social group who are likely to perceive the same information, the same message, quite differently (Watson & Hill, 1997).

If an institution has number of educators who are **computer orientated** and have a positive perception toward the use of information technology, it will be easier for that institution to integrate computer aided instruction (CAI) into in technical subjects. Once the information technology user has **effectively selected** and differentiated his/her perception of integrating information technology in technical subject then effective learning may occur (Davis, 1989). The word 'Gestalt' is German for 'pattern' or 'form' and the theory emphasizes our ability to perceive pattern as a whole (Child, 1993). Being so integrally part of our frames of reference, and ourselves our impressions of ourselves have a profound influence on educators' perceptions of others and the world around us. Therefore, it is essential to look at the way in which we perceive ourselves before we look at the way in which we perceive other people.

Perception is motivated by the indeterminacy of **experience and our perceptual skills serve** to make determinable objects sufficiently determinate for us to get an optimal grip on them. Moreover, we wouldn't want to evolve beyond the tendency of our bodies to move so as to get a grip on the world since this tendency is what leads us to organise our experience into the experience of stable objects in the first place. Without our constant sense of the uncertainty and instability of our world and our constant moving to overcome it, we would have no stable world at all (Piek & Mahlangu, 1990).

Perception always depends on **previous experience** (Child, 1993). Therefore, it is essential to start from a point in the presentation of material, which enables the learner to call on

previous experience (advance organizers). Understanding rather than rote learning is important in the formation of clear perception and is more likely to assist in long-term memory. However, understanding is not always possible as, for instance, when learning letters of the alphabet or numbers. The main determinants affecting implementation included: the staff's perceptions of computer education; the support structures established within the school to afford its introduction; environmental constraints; the issue of suitable software; and the provision for continuity of the established programme (Fielding, 1995).

Positive perceptions not only build effective individuality but also build solidarity within groups. They charge the social atmosphere with such positive energies that instill joy, creativity, sense of purpose and friendship in people. For example, a positively charged classroom atmosphere is conducive to joyous learning where work becomes an **expression of creativity and productivity**. The research into educators' and students' perceptions of teaching and learning contexts established a series of systematic associations linking educators' perceptions and approaches with students' perceptions, learning approaches and outcomes (Biggs, 1999; Marton & Booth, 1997; Prosser & Trigwell, 1999).

Educators **conceptualize** and approach teaching in a limited number of **qualitatively** different but related ways. Broadly, educators who perceive learning as the accumulation of information are more likely to view teaching as the transfer of information. Such educators are more likely to use an educator centred approach where the educator imparts information to students and uses assessment techniques, which encourage and test rote learning. In contrast, educators who view learning as conceptual change are more likely to view teaching as facilitating conceptual change (Prosser & Trigwell, 1999).

Some studies by Parr, (1999) provide a basis for investigating perceptions of experienced educators. In the past decade the nature of learning computer technologies has changed, with text-based, locally-networked, computer-assisted instructional software being replaced by graphics-rich, globally-networked computer environments, which makes earlier studies less helpful (Honey, Culp & Carrigg, 2000). Professional development programs have been targeted at keeping experienced educators' knowledge current. Research indicates, however, that brief-exposure programs about information technology made available to experienced educators have been unsuccessful (Schrum, 1999). Our research investigated the questions: (a) How do experienced technical college educators perceive learning computer technologies? (b) Are the perceptions consistent with the integration of learning computer technologies in classrooms in a manner likely to encourage enhanced learning outcomes?

Information technology Perception: Educator's knowledge about information technology affects their perception of integration, which in turn affects their decision to use it. Educator awareness is highly correlated with educator perception about information technology. In other words, educators who have higher awareness of technology tend to have better perception toward using technology (Coffland, 2000). However, the lack of knowledge about hardware and software is a common barrier in the literature (Weber, 1996). Lack of knowledge of information technology is only part of the problem. Many educators report their lack of knowledge about methods to integrate technology and the lack of knowledge about technical subject's curriculum as the reasons for the little use of technology in their classrooms (Manouchehri, 1999). A research study by Ertmer, Addison, Lane and Ross (1999) found that educator's perception of the role of technology (what it should do in the classroom) is closely related to how the educator uses the information technology. They also found that an educator's knowledge of information technology does not always match his or her perception of information technology's role, making

it difficult to use technology in the classroom. Another barrier is the perception of technology something unstable and always changing (Slough and Chamblee, 2000). When perceiving technology as such, educators are less likely to integrate technology with technical subject curriculum.

Educator's knowledge about information technology also affects their perception of integration, which in turn affects their decision to use it. Educator awareness is highly correlated with educator perception about information technology. In other words, educators who have a greater awareness of technology tend to have a better perception toward using technology (Coffland, 2000). However, the lack of knowledge about hardware and software is a common barrier in the literature (Weber, 1996). Lack of knowledge of information technology is only part of the problem. Many educators report their lack of knowledge of methods to integrate technology and the lack of knowledge about technical subject's curriculum as the reasons for the little use of technology in their classrooms (Manouchehri, 1999). A research study by Ertmer, Addison, Lane and Ross (1999) found that educator's perception of the role of technology (what it should do in the classroom) is closely related to how the educator uses information technology. They also found that an educator's knowledge of information technology does not always match his or her perception of information technology's role, making it difficult to use technology in the classroom. Another barrier is the perception of technology as something unstable and always changing (Slough and Chamblee, 2000). When perceiving technology as such, educators are less likely to integrate technology with technical subject curriculum.

1.6 Theoretical and conceptual frameworks:

There are three basic research paradigms that are used in human science, which are positivism (quantitative, scientific approach), interpretivism, and critical science (Cantrell, Undated.). The researcher will concentrate only on interpretivism as his paradigm for this study. The reason for using this theoretical framework is that the researcher would like to look at the procedures that are laid down by philosophy of information technology compared with the perception of the educators in teaching technical subjects and how the educators' perception affects the cognitivism of learning.

Interpretivism: Interpretivism is critical of positivism because it seeks to collect and analyze data from parts of a phenomenon and, in so doing, positivism can miss important aspects of a comprehensive understanding of the whole. Interpretivism proposes that there are multiple realities, not single realities of phenomena, and that these realities can differ across time and place (O'Brien, Undated). In this study, the interpretivism will help the researcher with the realities of educator's perception.

Knowledge is thus seen to be comprised of multiple sets of interpretations that are part of the social and cultural context in which it occurs. Interpretive researchers hold, consequently, that there should be openness to the understanding of people whom researchers study and tentativeness in the way researchers hold or apply their conceptions of those being studied (Giorgi, 1997; Husen, 1999; van Manen, 1998). This study will help to enable the researcher to more accurately manage the information from the participants. The interpretivism approach tends to look at the historical events; therefore, the researcher will look at the

history of information technology users against the use of information technology by the educators and their general perceptions of information technology.

Theories: There are three learning theories that are commonly used in education research under the paradigm of interpretivism; they are Behaviourism, cognitivism and constructivism. In this study, the researcher will use the cognitive theory, but more on the strength and weaknesses of cognitive theories based on the educators perception in using information technology in technical subjects (Bordwell, 2000). According to Gestalt and other researchers such as Edward Chase Tolman of the United States, and Jean Piaget (1896-1980) of Switzerland, cognitivism is the study of how people see and understand the relation of the whole to the parts that make up the whole. The study will aim to follow psychological theory about the steps of psychologist's perceptions and compare these with the educator's perception towards the use of information technology in technical subjects. Therefore, this theory of cognitivism will also help the researcher to understand the sensory environment that influences the organism's perception and assist to formulate the policy and principles on educator's perception about the integration of information technology into education (Parr, 1999).

Cognitive theorists recognize that much learning involves associations established through contiguity and repetition. They also acknowledge the importance of reinforcement, although they stress its role in providing feedback about the correctness of responses over its role as a motivator. However, even while accepting such behavioristic concepts, cognitive theorists view learning as involving the acquisition or reorganization of the cognitive structures through which humans process and store information (Good and Brophy, 1990).

Cognitivism has strongly influenced the development of instructional design theories. For instance, Robert Gagné's early instructional design theories were initially heavily rooted in the behaviourist psychology paradigm. Later, in the 1970s, he incorporated cognitivist psychology theories, specifically the information-processing model of cognition. Gagné considered the information-processing model a major advance in the scientific study of human learning (Gagné, 1977). As Michael J. Striebel noted, Instructional design theories such as Gagné's theory, take the cognitivist paradigm one logical step further by claiming that an instruction plan can generate both appropriate environmental stimuli and instructional interactions, and thereby bring about a change in cognitive structures of the learner (Striebel, 1995).

Cognitive theories stress the acquisition of knowledge and internal structures and, as such, are closer to the rationalist end of the epistemology continuum. Learning is equated with discrete changes between states of knowledge rather than with changes in the probability of response. Cognitive theories focus on the conceptualization of students' learning processes and address the issues of how information is received, organized, stored, and retrieved by the mind. Learning is concerned not so much, with what learners do but with what they know and how they come to acquire it. The learner describes knowledge acquisition as a mental activity that entails internal coding and structuring. The learner is viewed as a very active participant in the learning process (Zhao & Cziko, 1996).

1.7 Research design and methodology

1.7.1 The nature of qualitative research: According to the researchers such as Babbie (1993), Bernard (2000) & Leedy (1993) qualitative research is concerned with developing explanations of social phenomena. That is to say, it aims to help us to understand the world in which we live and why things are the way they are. It is concerned with the social aspects of our world and seeks to answer questions about: Why people behave the way they do, how opinions and attitudes are formed, how people are affected by the events that go on around them, how and why cultures have developed in the way they have, the differences between social groups.

Qualitative research is concerned with finding the answers to questions which begin with: why? How? In what way? Quantitative research, on the other hand, is more concerned with other questions about: how much? How many? How often? To what extent? Further features of qualitative research and how it differs from quantitative research are listed below.

- Qualitative research is concerned with the opinions, experiences and feelings of individuals producing subjective data.
- Qualitative research describes social phenomena as they occur naturally. No attempt is made to manipulate the situation under study as is the case with experimental quantitative research.
- Understanding of a situation is gained through a holistic perspective. Quantitative research depends on the ability to identify a set of variables.
- Data are used to develop concepts and theories that help us to understand the social world. This is an inductive approach to the development of theory.

- Qualitative data are collected through direct encounters with individuals, through one to one interviews or group interviews or by observation. Data collection is time consuming.
- The intensive and time-consuming nature of data collection necessitates the use of small samples.

1.7.2 Qualitative research designs: Four major types of qualitative research design are outlined. They are: **Phenomenology, Ethnography, Grounded theory and Case study** (Yuen, Law, & Wong, 2003). Therefore, the researcher used the case study because it has qualitative and quantitative. The study concentrated at one institution and based at one topic

1.7.3 Case study: Case study research is one of those research approaches, which can take a qualitative or quantitative stance. In this study, the qualitative approach to the case study is described wherein the value of case study relates to the in-depth analysis of a single or small number of units. Case study research is used to describe an entity that forms a single unit such as a person, an organisation or an institution (Yin, 1984). Some research studies describe a series of cases. Case study research ranges in complexity. The most simple is an illustrative description of a single event or occurrence. More complex is the analysis of a social situation over a period of time (Ragin, 1994 & Newman, 2003). According to Creswell (1998) as case of study can be regarded as an exploration or in-depth analysis of a bounded system bounded by time and/or place or a single or multiple cases, over a period. As Babbie (2001) points out that, there is little consensus on what may constitute a case or bounded system in the words of Creswell. The case being studied can refer to a process, activity, event, programme or individual or multiple individuals. It might even refer to a period of time rather than a particular group of people (De Vos, Strydom, Fouché, and Delport, 2002)

A key strength of the case study method involves using multiple sources and techniques in the data gathering process. “The researcher determines in advance what evidence to gather and what analysis techniques to use with the data to answer the research questions. Data gathered is normally largely qualitative, but it may also be quantitative (Busha, & Harter, 1980).

1.7.4 Procedure of collecting data:

Researcher asked permission from the director of institution under the department of information technology and also from the lecturers using Information technology in teaching technical subjects. The researcher conducted his study during the time the when lecturers present their lesson in FET College. With the permission of the participants’, the researcher will use video camera for observation and interviews. A tape recorder was used when conditions are not conducive for video recording.

1.7.5 Sampling:

There are few educators in at the FET College who are specializing in Information technology who make the researchers sampling to be convenient sampling and judgment sampling. Purposive sampling is where the researcher uses the most accessible element of the population. Judgment sampling is where the researcher uses his judgment as to whether the element of the population selected has knowledge of the required study are selected (Neuman, 2003)

1.7.6 Instrument of data collection:

The main reason why the researcher uses the case study in this study is to get more information from the populations that have been used for the sampling methods. Therefore, the researcher will use the most popular instrument when conducting the case study researcher, which uses the following instruments: **interviews, documents observations or archival records and participation observation** (McBeath, 2002).

Records analysis for critical question one: The researcher recorded the type of presentation programs they use when teaching the educational technology modules. Visiting the FET College Resource Center and record the condition of material they have. Find about the support they have from the management of university with the resources (Appendix 1).

Observation for critical question two: Researchers such as Wisker (2001) Bless & Higson-Smith (1995) said that there are different types of observation, that is: simple observation and participant observation. A researcher can observe the social behaviour of people interacting in bars, shops, pleasure resorts or at political rallies, by recording the number of people who do not know each other, exchange words, the topic and length of conversations, the way the interaction starts and end, and so on. Although simple observation is based on the assumption that the observer observes merely in fact the observation itself, introduces bias by the very fact of the observed person's awareness of being observed (Appendix 2).

Interviews for critical question three: According to the following researchers such as Bernard (2000), Alston, & Bowles, (2003) and Dawson (2002), there are many types of interviews in social research. The most common of these are unstructured, semi-structured

and structured interviews. The researcher concentrated on semi-structured interviews. It is perhaps the most common type of interview used in qualitative social research. The researcher wants to know specific information, which can be compared and contrasted with information gained in the other interview. To do this, the same questions need to be asked in each interview. However, the researcher also wants the interview to remain flexible so that other important information can still arise (Appendix 3).

1.7.6 Data analysis: Researcher used graphics to analyse other part of the study therefore the quantitative will be use and qualitative also be used for record analysis.

CHAPTER TWO

LITERATURE REVIEW

2.1 *Introductions*

To elaborate the contextual meaning of perception, especially to the human being, the researcher would start with the fact that educators also have a perception towards the use of computer technology in technical subjects. Their perception can be positive or negative, but it may influence the use of computer technology in technical education. The energy causing reaction or sensation in the sense organ is called stimulus. Being aware of sensation involves more than the functioning of the relevant sense organ and it automatically triggers perception. "Perception can be defined as the (main cognitive) process that accompanies the stimulation of one or more sense organs and which allows one to receive and process information from the environment" (Bedeck & Plug, 1993).

The meaning of perception enables one to live in harmony with one's surroundings. Perception is necessary for self-preservation, for which we need to be aware of what is going on around us, so that we can take necessary action to avoid danger; our senses also provide pleasure, such as the perception of scent, sound, etc and so increase our welfare (Lowe, 1995).

2.2 *What is perception?*

Perception is our awareness of the world and its contents through sensory experience. The analysis of perception and the attempt to deal with skeptical arguments about perception knowledge are central philosophical topics. Perception involves both our capacity to be sensorily affected by external objects and our ability to bring these objects of perception are related to us and to physical objects are matters of continuing concern.

The perception of becoming aware and making sense of stimuli received from our environment by the senses; sight, hearing, smells, taste and touch. Social perception refers to the application of this process to our attempts to explain, understand, make judgments about and predict the behaviour of other people. Perception is selective. We are surrounded by many sensations but we tend to direct our attention to only a few of these. The educator's decision as to what to attend to can be influenced by environmental and personal factors: for example, environmental factors can include present needs and drive, physiological features, past experiences and learning-perceptual set and personality. The influence of personal factors explains why the individual may pay attention to different stimuli, different messages or parts of a message (Watson & Hill, 1997). The researcher would like to look at the technical environment, and the set-up of the subject. The resources at technical FET colleges are conducive to the use of computer technology so that the educators' perception can influence the learning environment.

With the above statement of the researchers, that while the researcher wants to look at technical educators, whether their perception will affect the use of computer technology in the teaching and learning of technical subjects. On the other hand, the educators would be able to sustain the relationship with each other so that their perception of their specialization will not affect the use of computer technology in technical subjects. We cannot help making sense of our world. How this might be done varies from one person to another. The basic sensory signals from objects are the same, but the way we apprehend them differs because of the circumstances in which similar sensory experience have occurred (Child, 1993).

According to Steinberg (1995) perceptions have a feature of a personal process which provides each of us with a unique view of the world. It does not, however, always provide us with an accurate representation of the world. The result is that our understanding of many situations can be distorted. Some people distort the information that comes to them through their senses to such an extent that their perceptions of themselves, others, and the events around them have little resemblance to reality. The two major causes of perceptual distortions are perceptual inaccuracies and the elements of subjectivity in the perception process. The process of perception occurs in three principal stages, that is selection, organisation and interpretation.

2.3 *Selection*

The researcher would like to look at the statements of Steinberg as the beginning of all the perceptions of the individual. To prevent distorted perceptions among educators, the researcher aims to give them the platform to express their perceptions about computer technology. If each of the educators selects and organizes, his/her perception that means the organization is not unique. Educators select only some aspects of information from the environment: those which attract our attention at a given time. When you are deeply engrossed in a book, for example, it is unlikely that you will hear the ticking of your alarm clock or the traffic noise in the background. It is only when your attention lapses that you pay attention to these sounds. The first stage in the perception process is that, from the variety of information your senses receive, your brain selects that which is relevant in a particular situation.

2.4 *Selective Perception*

During this phase the educator focuses attention on the essential features of the instructional presentation. It is not always possible for ICT training staff to ascertain by simple inspection where educators are focusing their attention; and educators often fail to learn because they have focused on the wrong information. Educators often assume that because their own attention is focused on the right aspects of the presentation, their students must be focusing on the same aspects. It is best to test this assumption and to

make corrections when necessary. Educators usually concentrate a selection of the program in computer technology that they are more comfortable with, without using the whole program of computer technology thus leading to developing a negative perception towards it.

Failure at this selective perception can occur either because the presentation inadequately draws attention, because the educator fails to direct attention, or because of a combination of both of these reasons. A frequent source of faulty selective perception is a fundamental misconception about the topic under consideration: the educator may think he/she is focusing on the correct information, when in reality this is a mistake.

2.5 *Differential perception*

ICT training staff often assume that because their own attention is focused on the right aspects of the presentation, their students must be focusing on the same aspects. It is best to test this assumption and to make corrections when necessary. ICT training staff usually concentrate on the aspects of computer technology that they are more comfortable with, without using the whole program of computer technology thus leading educators to have to have a negative perception towards it. The perception of each individual or social group is influenced by a number of factors: knowledge, experience, social environment and personality, for example. The precise nature of the influence these factors have varies with each individual or social group and they are likely to perceive the same information, the same message, quite differently (Watson & Hill, 1997).

Educators that have more subject and computer knowledge are familiar with ICT and have already a mature attitude toward the use of computer technology in technical subjects. If an institution has a number of educators who are computer orientated and have a positive perception toward the use of computer technology, it will be easier for that institution to integrate computer aided instruction (CAI) into technical subjects. Once the brain has selected the relevant material, it arranges its selections into a meaningful whole. Once the computer technology user has effectively selected and differentiated his/her perception of integrating of computer technology in technical subject then effective learning may occur (Davis, 1989).

2.6 Organization

After sensory stimuli have selected and organised, we give meaning in light of our frame of reference (our personal circumstance and past experiences) in what is called **perceptual interpretation**. Because people are individuals, they are unlikely to select the same sensory information or to organise it in the same way. They are thus unlikely to arrive at the same interpretation of events or other people. The selection of the program used by an educator can depend upon the perception of the educator and the understanding of the programmes, whether it will make him/her comfortable in the classroom. The educator must be able to use computer technology without fear (Koohang, 1989).

A researcher, such as Fielding (1995) describes intrapersonal communication as the way in which we communicate with ourselves. The messages we give ourselves help us to form a view of ourselves, or self-image. We also build up self-esteem as we work with other people. They react to us and give us messages about ourselves. We also form self-image through experience. Our self-image may be positive or negative. If we perceive ourselves in a positive way, we are likely to work confidently with others. However, if we perceive ourselves in a negative way, we might perform below our actual ability. This called a self-fulfilling prophecy. People might then form a poor impression of us. A negative self-image might also make people defensive. Communication with these people is likely to be difficult. Educators who feel intimidated by computer technology or who may have a negative self-image may develop a negative perception of computer technology.

2.7 *The nature of perception*

Theories of how we establish perception and how things appear to us are of two basic kinds. At one extreme, it is commonly believed that, apart from in-built tendencies to distinguish figure and ground, we gradually learn to identify and interpret objects or arrangements of objects. The word 'Gestalt' is German for 'pattern' or 'form' and the theory emphasizes our ability to perceive pattern as wholes (Child, 1993). Being so integrally part of our frames of reference, and ourselves our impressions of ourselves have a profound influence on educators' perceptions of others and the world around us. Therefore, it is essential to look at the way in which we perceive ourselves before we

look at the way in which we perceive other people. Should you detect any problems in this area, you should spare no effort in addressing them. Because each of us uses the self as a reference point from which to communicate, problematic self-perceptions can only lead to problematic interactions.

2.8 *Self concept*

Your self-concept is your personal answer to the question: “Who am I?” It is a composition of all the answers that are reflected back to you like images by those who play a role in your life. Your self-concept includes all the ideas you have about yourself—ranging from physical aspects to personality traits, likes, and dislikes, abilities, talents and weaknesses. However, you learnt many of the ideas you have about yourself from other people. They told you that you are a dependable person. They said you were hot-tempered. They responded to you in a way that led you to believe that you have certain characteristics, and that you are lacking in others.

It is interesting to note that people's positive or negative states of mind arise from their self-concept, i.e. the image they have built about their own selves. People perceive the world through the tinted glass of their self-concept. If your glass is bright, you see yourself as worthy, able, and good. This attitude leads you to achieve success. In addition, that experience of success strengthens your image, leading again to achieve success. For instance, if you think that you are a winner, that thought gives you courage to win. Thus success teaches success. So does failure also self-perpetuate? Here we see

how the negative mind is caught in a vicious circle, difficult to break away from. Psychologists have found that those who have positive self- concepts can face challenges of life courageously and they are not broken down easily. Even if broken down they can regain normalcy within a shorter period compared to persons with negative self-concepts. In essence a positive self-concept is empowering (Miller & Olson, 1994).

According to Russell & Bradley (1997), educators bear witness to the fact that most of the high achieving students in schools have positive self-esteem. In the past educators thought, that intelligence was the single factor for successful learning. Now they are increasingly realizing the significance of self-esteem as a factor for successful learning. One who has a low self-esteem finds it difficult to appreciate others, care for others wholeheartedly, because of the insufficiency within. Only a person with a positive self-esteem can face challenges of life healthily. There is a need in every human being to build a positive self-esteem. It is a basic human need. People build their self-esteem from others' recognition and acceptance. On the other hand, an undervalued self-esteem leads a person to withdraw himself and be submissive to others' manipulation. Technical Colleges should help educators to develop a realistic and healthy self-esteem.

While self concept is the sum of your impression about yourself, self-esteem is the extent to which you value and like yourself- your self perception of your own worth, the way you feel about yourself (good or bad). There is a strong link between the two concepts. However, this link is not as strong as one might imagine. Someone may, in theory, believe that he is reasonably attractive and intelligent, but may still suffer from feelings

of inadequacy, of being ‘not good enough’. A term related to self-esteem is “self image” to have low self esteem is to have a poor self image.

- Similarity in self-esteem affects our choices with whom to interact (Pearson, Turner & Todd-Mancillas, 1999). If you feel good about yourself, you will probably choose to spend more time with others who also have high self-esteem.
- Self-esteem affects the confidence level with which you enter a communication situation. It is easier and much more enjoyable to communicate with other people if you feel good about yourself and you do not feel inferior to them. However, if you suffer from low self-esteem, you may feel apprehensive about the prospect of communicating with other people, or you may even avoid certain communication situations entirely.
- Self-esteem affects your perceptions of others. Someone who rates herself negatively is likely to rate others negatively either because she perceives the same negative traits in them as she perceives in herself, or because she perceives them as ‘making me feel inferior’ by their superior perceptions or abilities. If you do not like yourself you will find it difficult to like other people.
- Self-esteem affects the meanings you attach to someone else’s message. If, for example, you have a high self-esteem and someone compliments you on something, you may take the compliment at face value. Nevertheless, if you have a low self-

esteem, you may think the person is being sarcastic and derogatory, bruising your self-esteem still further.

- Self-esteem affects your own messages. According to Campbell (1990), people with low self-esteem often disapprove of themselves and communicate in ways that reflect this, for instance, 'I worked very hard on the assignment, but it is probably not that good – I suppose I'll get an average mark'.

Our self-concept and self-esteem operate in such a way that they often reinforce themselves. This is what self-fulfilling prophecies are all about. Your self-concept and self-esteem will lead you to expect certain behavior from others in response to you. But, often without you knowing it, you alter your own behavior in accordance with your expectation of who other people will react. Self-fulfilling prophecy occurs when you expect other people to behave in a certain way and your expectation and your own-corresponding behavior leads to the fulfillment and confirmation of your expectation; reinforce it for similar future encounters (Oliver & du Plooy–Cilliers, 2000).

When you have a positive outlook, you see the brighter side of things, including yourself, others, events of life and nature. In short, it is to see "The silver lining in the dark cloud" as William Blake puts it. Positive perception brings in contentment, happiness and hope. All life-fulfilling experiences arise from a positive state of mind. They naturally lead to a harmonious relationship with others. Educators who know the processes and outcomes of observational learning are better able to decide when and under what conditions models

might prove useful. If, for example, an educator wants to motivate students or to arouse some interest in an upcoming project; employing a model to demonstrate the project would be a reasonable plan.

2.9 *Selecting Effective Models*

In order to select the right model, an educator must know what makes a model more or less effective. Effectiveness depends on the perceptions of the observer; model effectiveness is in the eye of the beholder. Slough & Chamblee (2000) now examine two types of observer perception, similarity and competence, and ways in which those perceptions relate to peer modeling. When the educators' perception is to use computer technology as an effective model to integrate with the technical instruction, the learner will benefit from the observation of the technology. Perceived similarity is an observers' perception of similarity between him or her and the model. As is the case with other characteristics of a model, the observer's perception influences the model's effectiveness. The tendency to imitate behavior performed by same-sex models can therefore be attributed to perceived similarity. It is an important element of model effectiveness. If an observer sees him or herself as being similar to the model and then observes the model succeeding in a particular situation, the observer is more likely to infer self-efficacy. Thus, perceived similarity means that the observer is likely to say to him or herself, "if he (she) can do it, I can do it."

2.10 *Perceive competence*

Perceived competence is an observer's evaluation of how expert a model is. Simon, Districhs, & Speckhart (1975) found that children are more likely to follow the behavior of models they perceived as being competent than they are to follow models they perceive as being less than competent in the displayed skill. Perceived competence can be influenced by an observer's perception of a model's social status. One attains high social high social status by distinguishing her or himself from others in a field of endeavor McCown, Driscoll & Roop, (1998).

An educator who is judged by students to be a really great educator has attained high status within the school community. The educator may have attained that status because he or she is a recognised authority in a particular academic field or is recognised as an educator who fosters student success. The technologies with which educators work, evoke a variety of different and sometimes competing perceptions of the realities that are being envisioned. The opportunity exists within the center to discuss and debate these perceptions with colleagues in the academic environment (Carlson, 2004). It goes beyond the applied demonstrations by incorporating exhibits that include interactions by which the observer can actively experience, seek and express his/her viewpoint on the perceptions that are presented.

2.11 *Perception and the educator*

Perception is motivated by the indeterminacy of experience and our perceptual skills serve to make determinable objects sufficiently determinate for us to get an optimal grip on them. Moreover, we wouldn't want to evolve beyond the tendency of our bodies to move so as to get a grip on the world since this tendency is what leads us to organise our experience into the experience of stable objects in the first place. Without our constant sense of the uncertainty and instability of our world and our constant moving to overcome it, we would have no stable world at all (Piek & Mahlangu, 1990).

Perception always depends on previous experience (Child, 1993). Therefore, it is essential to start from a point in the presentation of material which enables the learner to call on previous experience (advance organizers). Understanding rather than rote learning is important in the formation of clear perception and is more likely to assist in long-term memory. However, understanding is not always possible as, for instance, when learning letters of the alphabet or numbers. The educator should emphasize that the learning process consists of discovering meaning, building up patterns of knowledge and meaningful relations. The main determinants affecting implementation included: the staff's perceptions of computer education; the support structures established within the school to afford its introduction; environmental constraints; the issue of suitable software; and the provision for continuity of the established programme (Fleer, 1989).

2.12 *Perception and its influences in teaching*

Galligan (1997) emphasizes the role of individual educators in implementation of computer technology and how educators can affect the educational appropriateness of the technology: It is their [educators'] choices of how, when, where, why and by whom computer technologies are used that determine whether or not the technological pull is educationally beneficial. Although computer availability is important, the most important factors determining whether educators use computers effectively are planning time and educator perceptions, style and background. The question is often asked that whether we can look at every incident in life from a positive perspective. Looking at a painful experience positively does not mean that you accept it and cease to act. But if you look at it as something that opens your eyes to the reality or truth from which you can learn, then it is a positive outlook. Many such incidents can be perceived as opportunities as well. For instance, in the Chinese language the word conflict means opportunity. When life closes one door, it opens another. Instead of weeping for the door closed, we can look for the next door opened (Venkatesh & Davis, 2000).

Positive perceptions not only build effective individuality but also build solidarity within groups. They charge the social atmosphere with such positive energies that instil joy, creativity, sense of purpose and friendship in people. For example, a positively charged classroom atmosphere is so conducive to joyous learning where work becomes an expression of creativity and productivity. The research into educators' and students' perceptions of teaching and learning contexts established a series of systematic

associations linking educators' perceptions and approaches with students' perceptions, learning approaches and outcomes (Biggs, 1999; Marton & Booth, 1997; Prosser & Trigwell, 1999). An explanation of these associations is important to understanding the significance of investigating educators' perceptions of learning technologies.

Educators conceptualise and approach teaching in a limited number of qualitatively different but related ways. Broadly, educators who perceive learning as the accumulation of information are more likely to view teaching as the transfer of information. Such educators are more likely to use an educator centred approach where the educator imparts information to students and uses assessment techniques, which encourage and test rote learning. In contrast, educators who view learning as conceptual change are more likely to view teaching as facilitating conceptual change. Such educators are more likely to use a student centred teaching approach where independence in learning is encouraged through discussion, debate and questioning among students, and assessment which reveals conceptual change (Prosser & Trigwell, 1999).

Some studies by Parr, (1999) provide a basis for investigating perceptions of experienced educators. In the past decade the nature of learning computer technologies has changed, with text-based, locally-networked, computer-assisted instructional software being replaced by graphics-rich, globally-networked computer environments, which makes earlier studies less helpful (Honey, Culp & Carrigg, 2000). Professional development programs have been targeted at keeping experienced educators' knowledge current. Research indicates, however, that brief-exposure programs about computer technology

made available to experienced educators have been unsuccessful (Schrum, 1999). Our research investigated the questions:

- How do experienced technical college educators perceive learning computer technologies?
- Are the perceptions consistent with the integration of learning computer technologies in classrooms in a manner likely to encourage enhanced learning outcomes?

The learning context provided by an educator is the practical implementation of the educator's perceptions of learning and teaching, and approach to teaching. Students have been found to vary their learning approach in response to certain factors they perceive in the learning context. Students using deep learning approaches are more likely to value independence in learning, good teaching and clear learning goals, factors consistent with a student-centred teaching approach. Students using surface learning approaches are more likely to have different values, and, consequently different perceptions.

Educators' perceptions and approaches and, consequently, the learning contexts they provide, are known to influence students' perceptions. Successful integration of learning computer technologies leading to enhanced learning outcomes is unlikely unless educators perceive and use computer technology as an integral part of a student centred/conceptual change teaching approach. Only through students perceiving learning

technologies as part of a learning context, which encourages independence in learning and deep learning approaches, are enhanced learning outcomes likely

Dupagne and Krendal (cited by Morton, 1996) completed a review of literature on educator attitudes towards computers. They are able to identify many aspects related to educators' perceptions of computers, the impact of computer use and the impact of personal and learning environment characteristics affecting an educator's intention to use computers as teaching learning strategies. A critical factor that all staff needs to recognize and understand is that integrating computers into classroom practice is a complex innovation which requires a holistic change in the school's practices and culture, to the curriculum, the educator's attitudes and classroom practice.

Educators' perceptions and approaches and, consequently, the learning contexts they provide, are known to influence students' perceptions. Successful integration of learning computer technologies leading to enhanced learning outcomes is unlikely unless educators perceive and use computer technology as an integral part of a student centred/conceptual change teaching approach. Only through students perceiving learning technologies as part of a learning context, which encourages independence in learning and deep learning approaches, are enhanced learning outcomes likely (Yildirim, 2000).

Newhouse (1995) identifies educators' lack of computer literacy as being an obstacle to their usage of computers in classrooms. Newhouse draws a conclusion about the number of years of experience with computers educators have and the impact they make on the

implementation process: Most educators need two or three additional years of experience using computers to become significant users of computers in classrooms. Educators need up to five years solid experience in using computers to become proficient at integrating those [computers] in the curriculum.

A positive outlook can be used effectively for self-development. For instance, educators need to have a positive perception towards learning. A positive perception to learning is a source of motivation for students. First, FET Colleges have to develop a positive perception to learning in educators. Yet, some traditional technical colleges do quite the opposite, by viewing learning in a narrow sense. Until recently, technical colleges could not imagine education without tears. Learning is meaningful to the degree it is related to self and life. In most of the technical subjects compartmentalized learning has no relevance to self or life. Such education rarely provides insight into true learning. In fact, the nature of learning and lifelong learning is rarely discussed with educators. Good educators always create positive perception to learning by the use of interesting and creative teaching methods. Students should not only learn the subject matter but also learn how to learn. Self-learning methods have to be introduced to them. The habit of reading also needs to be encouraged. Learning is effective when students themselves build knowledge by active learning and practice what they learned.

2.13 *Computer Technology Perception*

The educator's perception of the nature of computer technology and its role in the educator's pedagogical beliefs is also a barrier to integration (Ertmer and Hruskocy, 1999). Several research findings about perception can be summarized into two major categories: experience with computer technology and knowledge about computer technology. Educators who grew up learning technical subjects using the traditional methods tend to question the role of computer technology and feel insecure in the integrated form of teaching (Hazzan, 2000). Slough and Chamblee (2000) also reported that educators, who have a positive experience using computer technology to do their work, tend to teach their students with computer technology. Many educators did not grow up learning computer technology and often do not have experience personally of the helpfulness of computer technology. This lack of experience becomes a barrier in integrating computer technology when teaching technical subjects.

Educator's knowledge of computer technology also affects their perception of integration, which in turn affects their decision to use it. Educator awareness is highly correlated with educator perception about computer technology. In other words, educators who have greater awareness of technology tend to have better perception toward using technology (Coffland, 2000). However, the lack of knowledge about hardware and software is a common barrier in the literature (Weber, 1996). Lack of knowledge of computer technology is only part of the problem.

Many educators report their lack of knowledge of methods to integrate technology and the lack of knowledge about technical subject's curriculum as the reasons for the minimal use of technology in their classrooms (Manouchehri, 1999). A research study by Ertmer, Addison, Lane and Ross (1999) found that educator's perception of the role of technology (what it should do in the classroom) is closely related to how the educator uses the computer technology.

They also found that an educator's knowledge of computer technology does not always match his or her perception of computer technology's role, making it difficult to use technology in the classroom. Another barrier is the perception of technology as something unstable and always changing (Slough and Chamblee, 2000). When perceiving technology as such, educators are less likely to integrate technology with technical subject curriculum.

2.14 *A Perceptual-Control-Theory (PCT) Perspective on Technology Adoption*

Perceptual Control Theory (PCT) is a model of behaviour based on control theory, according to the theory by Powers (1973). Essentially, PCT maintains that human beings have internal goals, which they strive to reach. As control systems, human beings act to keep their perceptions in synchronization with these reference conditions. Educational researchers do this by acting on our environment, producing effects which, when combined with prevailing circumstances of the environment, produce the desired

perceptions. Human goals are hierarchical. In order to maintain a higher-level goal, it is necessary to vary lower-level goals. In other words, lower-level goals serve as means to achieve higher-level goals (Cziko, 1995; Powers, 1973).

The most important implication PCT has for research on technology adoption is the assumption that the decision to use or not to use technology is completely made by individuals based on the two interwoven concepts which distinguish this model from others: perception and hierarchy of goals. First, focusing on perception, this new model suggests that the decision is the result of subjective rather than objective decision-making processes. An individual will use technology only when it is perceived as a way to achieve a certain goal or a number of goals at a high level. In other words, the use of technology must have clear "benefits." But while this is a necessary condition, it is not sufficient, because a person may have multiple but conflicting goals at the same hierarchical level. While the use of technology may meet some goals, it can also have "costs"—it can impede or disturb other goals. The individual will then need to make choices based on the importance of the conflicting goals, often factoring in the role of the various goals in achieving even higher level goals (Zhao & Cziko, 1996).

This leads to a disarmingly simple model of technology use: the degree to which an educator uses technology (or any innovation for that matter) depends upon his/her perception of its relationship to the goals s/he tries to achieve. In other words, educators judge any change on two dimensions: costs and benefits. For an educator to use technology, the perceived benefits (potential to meet higher-level goals) must exceed the

perceived costs (potential to disturb higher-level goals). For example, although one can learn to access the World Wide Web in about 5 minutes, many educators believe it would take much more time. That perception can prevent them from using it because taking that time could mean giving up other goals, such as preparing for instruction, meeting with students, or spending time with their families.

"Perceived benefits" imply that whether or to what extent one uses technology depends on personal understandings about whether or to what extent the use of the technology helps meet important individual goals. For example, one of the perceptions that fuel the current push for educational uses of the Internet is that it can engage students in authentic tasks. Unless an educator believes that the Internet offers a way to more effectively accomplish goals that were already part of her current practice it is unlikely that she will use it. Of course, the use of the Internet might be perceived to meet other goals: to maintain the image of being professionally progressive and a life-long learner, for instance. Similarly, "perceived costs" refers to each individual's perception of the amount of disturbance the use of a technology may cause to other goals.

At this point, researchers must emphasize that both the construction and pursuit of hierarchy of goals and the process of determining benefits and costs is not necessarily rational and logically carried out. In fact, it is very often intuitive and even irrational. Moreover, costs and benefits are not always physical. They are often psychological and emotional. For example, an educator may decide to use a certain technology because it enhances a self-conception of being a professional who is on the cutting edge. On the

other hand, an educator may not use technology simply because the possibility of being embarrassed in front of his/her students by having trouble operating the computer may threaten his/her self-perception as a competent professional in control of the teaching environment (US Congress Office of Technology Assessment, 1995).

The successful use of information technology in the classroom depends on the educators' perceptions towards computer technology (Lawton & Gerschner, 1982). Gressard and Loyd (1985) found that the perceived usefulness of computer technology can influence perceptions towards computer technology, and the amount of confidence an educator possesses in using computer technology may influence his or her implementation in the classroom. Educators' perceptions have not been emphasised in the implementation of ICT into the classroom, though studies stated that educators' perceptions as well as knowledge and skills in using computer technology are major factors affecting their initial acceptance of computer technology and their future behaviour regarding computer usage (Violato, Mariniz & Hunter, 1989; Koohang, 1989).

Summers (1990) found that the lack of knowledge and experience in the computing area is one of the most common reasons for educators' negative perceptions towards computer technology. Educators' perceptions towards computer technology affect their instructional use of computer technology and likelihood of profiting from training (Kluever, Lam & Hoffman, 1994). Russell and Bradley (1997) found that male educators reported significantly greater confidence with computers than did females and recommended

educator professional development should take into account the particular needs of female educators.

Educators are often resistant to using computer technology in the classroom, so the development of educators' positive perceptions towards computer technology is considered to be a key factor in fostering computer integration and the enhancement of quality learning and teaching using computer technology (Yuen, Law & Chan, 1999). In investigating the changes in pre-service and in-service educators' perceptions towards computer technology, Yildirim (2000) found that educators' perceptions (anxiety, confidence, and liking) significantly improved after the computer literacy course. Yuen and Ma (2002) found that the two independent variables, perceived usefulness and perceived ease of use, directly affect the intention to computer use as stated in the Technology Acceptance Model (TAM). Furthermore, significant gender differences in computer acceptance were also found.

There are two important problems of which educators must be aware in connection with the principle of perception, firstly, there is a problem known as verbalism. Secondly, there is the great danger of an enthusiastic but incorrect application of the principle of perception. Verbalism means the use of words without due regard for their real meaning. This can happen when an educator believes that if the pupils can say something or know the relevant words, they have really learned something and therefore understand what the matter is all about. Words in themselves are nothing but empty abstractions. They have

content only when, by means of observation, they are coupled in a definite meaning and significance.

The child comes to school with a great store of knowledge and experiences. It is the task of the school in general, and the educators specifically, to verify the knowledge and experience so acquired, to extend and arrange it, and to assemble it, together with newly acquired knowledge, into a useful and functional whole. Words must where applicable go hand in hand with concrete observable material; Abstract thinking developed on this basis will be most effective.

CHAPTER THREE

THEORETICAL FRAMEWORK

3.1 Introduction

The assumptions that guide interventions are essential components of a paradigm; they may be so much a part of how one view the world that the assumptions are taken for granted as 'how things are.' In other words, one may choose a paradigm without even realizing it and without knowing there are alternatives. Discussing paradigms is important and beneficial because it makes possible reflective awareness of these assumptions and choices. There are three basic research paradigms that are used in human science, that are positivism (quantitative, scientific approach), interpretivism, and critical science (Cantrell, Undated.).

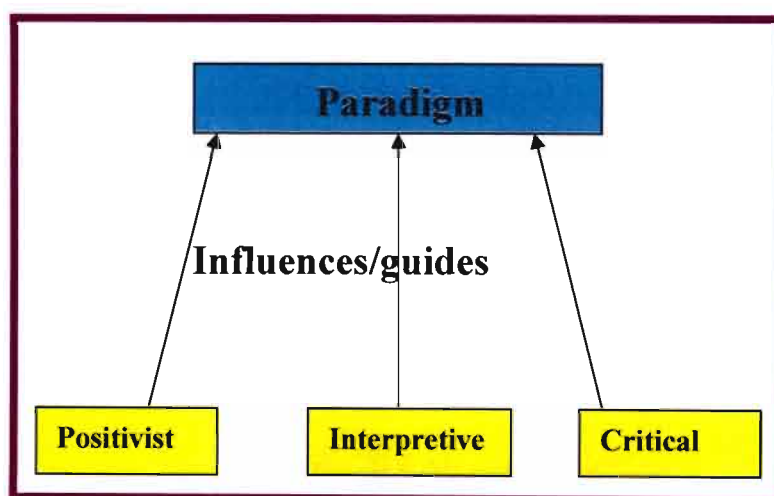


Figure 1: Research Paradigms

The researcher is using the above **Figure 1** to interpret the paradigm that he is using. The researcher is concentrating only on interpretivism as his paradigm or framework for this study, the reason for using this paradigm or framework is that the researcher would like to look at the procedures that are laid down by the philosophy of computer technology as compared with the perception of educators in teaching technical subjects. How educators perception affect the cognitivism of learning.

3.2 Interpretivism

Interpretive researchers start out with the assumption that access to reality (given or socially constructed) is only through social constructions such as language, consciousness and shared meanings. The philosophical base of interpretive research is hermeneutics and phenomenology (Boland, 1985). Interpretive studies generally attempt to understand phenomena through the meanings that people assign to them and interpretive methods of research in IS are "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (Walsham, 1993, p. 4-5). Interpretive research does not predefine dependent and independent variables, but focuses on the full complexity of human sense making as the situation emerges (Kaplan and Maxwell, 1994).

Interpretivism as developed by Dworkin (Undated) includes the claim that interpretation is sensitive to values in the way just explained, and that it is fundamental to the nature of law. Many theorists accept that, given the law, interpretation that is sensitive to values is necessarily employed in its application (Brink 2001).

It is a way to gain insights through discovering meanings by improving our comprehension of the whole. Qualitative research explores the richness, depth, and complexity of phenomena. Qualitative research, broadly defined, means "any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification" (Strauss & Corbin, 1990). Although acceptance of interpretivism is increasing within human movement sciences, positivism remains the dominant paradigm, as it does in other social science fields.

The underlying assumption of interpretivism is that the whole needs to be examined in order to understand phenomena. Interpretivism is critical of the positivism because it seeks to collect and analyze data from parts of a phenomena and, in so doing, positivism can miss important aspects of a comprehensive understanding of the whole. Interpretivism proposes that there are multiple realities, not single realities of phenomena, and that these realities can differ across time and place (O'Brien, Undated). In this study the interpretivism will help the researcher with the realities of nature.

Unlike quantitative research, there is no overarching framework for how qualitative research should be conducted; rather each type of qualitative research is guided by particular philosophical stances that are taken in relation by the research to each phenomenon. Interpretivism (also known as symbolic interactionism or interactionism) microsociological level paradigm: Focus is on how people themselves define reality, how they make sense of the world, how they experience and define what people are doing. Assumption is that social structures are created through interactions among people so that patterns and standards of behavior emerge, i.e. social reality is a construction by people. Focus on meanings assigned to actions and symbols, how meanings are learned and modified. It inquires into factors that influence how we interpret what we say and do and patterns that give rise to same interpretation for many (T S P, 2003)

In interpretive research, organizational and social realities are constructed as a product of theorizing, and this individual theorizing itself shapes and affects reality; there is no mind-independent reality to correspond with hypotheses to serve as an external referent point on their acceptability (Walker & Evers, 1999). Knowledge is thus seen to be comprised of multiple sets of interpretations that are part of the social and cultural context in which it occurs. Interpretive researchers hold, consequently, that there should be openness to the

understanding of people whom researchers study and tentativeness in the way researchers hold or apply their conceptions of those being studied (Giorgi, 1997; Husen, 1999; van Manen, 1998). This study helps the researcher to be able to comprise the information from the participants.

Interpretive research focuses on action. Thus, may be the thought of behaviour-with-meaning, it is intentional behaviour and as such, future oriented. Actions are only meaning to educators as far as they are able to ascertain the intentions of actors to share their experience. A large number of our everyday interactions with one another rely on such shared experience, but what of the interpretive researchers. They begin with individuals and set out to understand their interpretations of the world around them. Theory is emergent and must arise from particular situations; it should be grounded on data generated by the research act (Glaser and Strauss, 1967). Theory should not precede research but follow it.

Investigators work directly with experience and understanding to build their theory on them. The data thus yielded is glossed with the meanings and purpose of those people who are their sources. Further, the theory so generated must make sense to those to whom it applies. The aim of scientific investigation for the interpretive researcher is to understand how this glossing of reality goes on at one time and in one place and compares it with what goes on at different times and places. Thus, theory becomes sets of meaning, which yield insight, and understanding of people's behaviour. These theories are likely to be as diverse as the sets of human meanings and understandings that they are to explain. From an interpretive perspective, the hope of a universal theory, which characterizes the normative outlook, gives way to multifaceted changes of human behaviours and contexts supporting them.

Weber argued that social science needed to study meaningful social action, or social action with a purpose. He embraced *Verstehen* and felt that we must learn the personal reasons or motives that shape a person's internal feelings and guide decisions to act in particular ways (Weber, 1981). Interpretive social science is related to hermeneutics, a theory of meaning that originated in the nineteenth century. The term comes from a god in Greek mythology, Hermes, who had the job of communicating with the desires of the gods to mortals. It "literally means making the obscure plain" (Blaikie, 1993) cited by Neumann (2004).

There are several varieties of interpretive social science (ISS): hermeneutics, constructivism, and ethnomethodology; cognitive; idealist; phenomenological; subjectivist and qualitative sociology. Interpretive researchers often use participant observation and field research. These techniques require that researchers spend many hours in direct personal contact with those being studied. According to Neumann (2004), for interpretive researchers, the goal of social research is to develop an understanding of social life and discover how people construct meaning in natural settings. An interpretive researcher wants to learn what is meaningful or relevant to the people being studied, or how individuals experience daily life.

The researcher does this by getting to know a particular social setting and seeing it from the point of view of those in it. The researcher shares the feelings and interpretations of the people he or she studies and sees things through their eyes. Interpretive researchers study meaningful social action, not just the external or observable behaviour of people. Social action is the action to which people attach subjective meaning; it is activity with a purpose or intent. Interpretive social science says socially reality is not waiting to be discovered. Instead, the social world is largely what people perceive it to be social life exists as people experience it and give it meaning. It is fluid and fragile. People maintain it by interacting with others in

ongoing processes of communication and negotiation. They operate based on untested assumptions and taken-for-granted knowledge about people and events around them.

People possess an internally experienced sense of reality. This subjective sense of reality is crucial to grasp human social life. External human behaviour is an indirect and often obscure indicator of true social meaning. ISS says that “access to other human being is possible, however, only by indirect means: what we experience initially are gestures, sound, and action and only in the process of understanding it, “we take the step from external signs to the underlying inner life” (Bleicher, 1980)

The interpretivism approach has any tends of looking at the historical events; therefore the researcher will look at the history of computer technology user against the use of computer technology by the educators and their perception in computer technology.

3.3 Theories

There are three learning theories that are commonly used in the education research under the paradigm of interpretivism, that are behaviourism, cognitivism and constructivism. On this study, the researcher used the cognitivism theories, but more to the strength and weaknesses of cognitivism theories based on the educators perception in using computer technology in teaching technical subjects.

The paradigm shift in psychology from behaviourism to cognitivism in the twentieth century has spawned many new theories to help us not only better understand human learning but to design more effective ways to facilitate learning. For computer technologists and designers, Gagné’s (1977) approach to instructional design and the authentic learning environments

espoused by constructivists are but two of the contemporary learning and instructional theories that apply the important lessons learned from cognitivist research. This study will help the research into the perception, memory, and appreciation of human cognition that cognitivism has engendered is an important step in the evolution of our understanding of human cognition.

According to Gestalt (1967) and other researchers such as Edward Chase Tolman of the United States, and Jean Piaget (1896-1980) of Switzerland, cognitivism is the study of how people see and understand the relation of the whole to the parts that make up the whole. Organism responds to specific stimuli. Organization of the sensory environment influences the organism's perception. Concept of insight was introduced. Gestalt psychologists based their theories on experimental observations of behaviour. He established laws and principles of computer technology that was tested before, and then applied it to the real-world situations. The study helps to follow the steps of the psychologist's perception and compare them with the educator's perception towards the use of computer technology in technical subjects. Therefore, this theory of cognitivism also helps the researcher to understand the sensory environment that influence the organism's perception and assists to make the policy and principles.

Cognitivism has strongly influenced the development of instructional design theories. For instance, Robert Gagné's early instructional design theories were initially heavily rooted in the behaviourist psychology paradigm. Later, in the 1970s, he incorporated cognitivist psychology theories, specifically the information-processing model of cognition. Gagné considered the information-processing model a major advance in the scientific study of human learning (Gagné, 1977). As Striebel (1995) noted, Instructional design theories such as Gagné's theory, take the cognitivist paradigm one logical step further by claiming that an

instruction plan can generate both appropriate environmental stimuli and instructional interactions, and thereby bring about a change in cognitive structures of the learner.

Cognitivism seeks a unified, formal theory of the rational component of psychological functions such as language, perception, memory and thought. The principal means to develop this formal theory is to describe the operation of the brain in computational terms. This is not just a metaphor (Matlin, 1994). The brain is not studied 'as if' it were carrying out some sort of computation. Instead, it is assumed that what the brain does can be formalised in terms of computational theory.

It is this effort after a unified formal theory that shows the degree to which cognitivism inherits the positivist programme of modernist science. The effort is to perfect, through a programme of theory development, computer simulation and empirical investigation, a unified, formal and mechanistic account of a particular level of mental life, that is, of rational cognitive processing. According to (The Learning Domain, 2003), once developed, this account will help to understand how other aspects of mental life, including intentionality, the emotions and subjectivity, are produced and supported by this level. This programme has been highly productive during the second half of this century and presently cognitivism exerts a great influence over most of psychology and over related disciplines.

Happily, unlike behaviourism, cognitivism does not reject consciousness (Kristindottir, 2001). This, over the past decade or so, has made its way back towards the top of the psychological agenda. It would thus seem an appropriate time to consider the interaction that might be possible with Buddhism, where consciousness has been the focus of investigation for some 25 centuries. Educators shall start by identifying some Buddhist sources and specifying in more detail the aspects of cognitivism with which they might be compared.

Although Buddhism and cognitivism are situated within different cultural and metaphysical frameworks, both deal with the workings of the mind, the mind-body relationship and the nature of human action. Perhaps most significantly here, both present systematic systems of psychological enquiry. Accordingly, some attempt to bring the two into relation can be made so long as there is proper regard for what may and may not be compared.

Cognitivism, like any science, is in a constant state of development. Specific, peripheral issues turn over rapidly, while more general, central topics such as memory; perception and reasoning remain comparatively stable. Although subject to more measured development, these central topics, along with a distinctive methodology, maintain cognitivism's persistent identity by the researchers of Georgia State University, (1999). The lively activity of peripheral topics combined with longer-term movements of the central ones gives the development of the whole an amoeba-like character. While movement of the central issues to some extent generates the activity in more peripheral ones, the peripheral topics are more reactive to the wider intellectual milieu, and transmit directive influences back to the centre. These influences include the image of science on which cognitivism models itself. This image is changing. The modernist unitary discipline, dominated by reduction, Cartesian mechanism is giving way to a postmodern pluralist discourse in which reduction is balanced by emergence, and mechanism is tempered with Whiteheadian organicism.

Cognitivism, like behaviourism, emphasizes the role that environmental conditions play in facilitating learning. According to Kristindottir, (2001), Instructional explanations, demonstrations, illustrative examples and matched non-examples are all considered instrumental in guiding student learning. Similarly, emphasis is placed on the role of practice

with corrective feedback. Up to this point, little difference can be detected between these two theories. However, the "active" nature of the learner is perceived quite differently.

Cognitive theorists recognize that much learning involves associations established through contiguity and repetition. They also acknowledge the importance of reinforcement, although they stress its role in providing feedback about the correctness of responses over its role as a motivator. However, even while accepting such behaviorist concepts, cognitive theorists view learning as involving the acquisition or reorganization of the cognitive structures through which humans process and store information (Good and Brophy, 1990).

Cognitive theories stress the **acquisition of knowledge and internal structures** and, as such, are closer to the rationalist end of the epistemology continuum. Learning is equated with discrete changes between states of knowledge rather than with changes in the probability of response. Cognitive theories focus on how the educator's **conceptualization of students'** learning processes and address the issues of how information is received, organized, stored, and retrieved by the mind. Learning is concerned not so much, with what learners do but with what they know and how they come to acquire it. The learner describes knowledge acquisition as a mental activity that entails internal coding and structuring. The learner is viewed as a very active participant in the learning process.

Cognitive psychology states that the purpose of scientific psychology is to observe behaviour or the observable responses of individuals in order to make inferences about unobservable, underlying factors that can explain the actions researchers see by Atkinson, & Shiffrin, (1968). In cognitive psychology, observations are used to generate inferences about such things as thought, language, and meaning.

Unlike the behaviourists, the cognitivist attempts to speculate about internal mental processes and how individuals process information. The cognitivist is concerned with how individuals received information from the world, how such information is processed and how the information is manipulated and used to direct attention and behaviour. The researcher like Craik, F. & Lockhart, R. (1972) believes that Cognitive theorists perceive learning as composed of the reception of information from the outside world, its storage in short-term and long-term memory, information encoding, and the retrieval of information from memory.

Instruction based on the Cognitive perspective has the following characteristics:

- Information is loosely structured
- Lessons are highly interactive
- Good for problem solving and higher order learning.

A number of powerful concepts have arisen within cognitive psychology, each with considerable usefulness in education. Among these concepts are:

- Schemata, the idea that there are mental frameworks for comprehension;
- Constructive memory, the view that knowledge is created by learners as they confront new situations;
- Levels of processing, the notion that memory is a by-product of the kind of processing that information receives.

3.4 *Cognitivism Model: Information Processing*

Memory researchers have divided memory into stages of acquisition, storage, and retrieval. For a memory to be made, new information somehow must be acquired and brought into the system. Information also must be stored within the system and retrieved when it is needed. In the 1950s, cognitive scientists began creating models that acknowledged these stages; their

models also clearly reflected the increasing influence of the computer as a metaphor for human cognition. The models came to be known collectively as information processing models and their common features as the modal model (Bruning, Schraw & Ronning, 1995).

The modal model divides memory into three major categories: (1) sensory memory, (2) short-term (working) memory, and (3) long-term memory. These are labelled 1, 2, and 3, in the figure below:

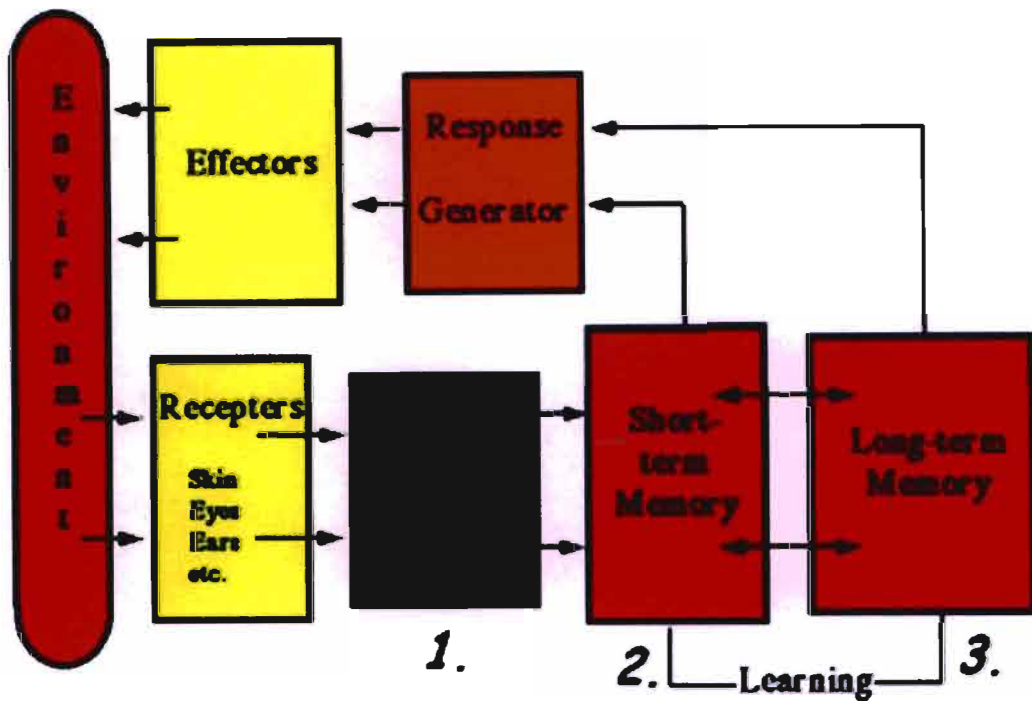


Figure 2: Cognitivism Model

With Figure 2, the information processing perspective of cognition is categorized by transformation of information from stimuli in the environment to a response by the learner. The process is initiated as receptors (ears, eyes, nose, mouth, and body) receive information in the form of stimulation (a teacher's lecture) from the outside world. These stimuli (words, pictures, smells, etc.) are transmitted as information to the central nervous system. For a brief period, the information is recorded in the sensory registers, a minute fraction of it is sent on to Short-Term Memory (STM), and all remaining information is lost. For example, as you read this information, a television may be on, or you may be in a computer lab with students

talking and typing, the chair is pressing against your skin; the room may be chilly, etc. In other words, your senses are bombard with information, which is being transmitted to your central nervous system. However, you only attend or pay attention to a small amount of the information (hopefully what you are reading), all else is lost. The researcher is concentrating on the environmental stage of the information processing, as where the educators perform their task of imparting and getting the feedback from the learners.

The environment can be classified from the educators as: the methods of teaching (lecturing, grouping and etc), the condition of the classroom (e.g. choke board, charters in the classroom, teaching equipments, and student's computers), communication between the educator and learners during the presentation of the lesson and thereafter. The relevancy of practical work that should be done by the learners and the lesson that has been taught by the educator is in line with the curriculum or program of study. From the of learner's side: the questions from the learners, the results of their homework and tests; and the practical skills that the learner shows at the end of the lesson. If, all the above environment conditions are acceptable then the informative processing of learning is acceptable in the cognitivism theories.

The cognitive approach focuses on the mental activities of the learner that lead up to a response and acknowledges the processes of mental planning, goal-setting, and organizational strategies. Cognitive theories contend that environmental "cues" and instructional components alone cannot account for all the learning that results from an instructional situation. Additional key elements include the way that learners attend to, code, transform, rehearse, store, and retrieve information (Striebel, 1995). Learners' thoughts, beliefs, attitudes, and values are also considered influential in the learning process. The real focus of the cognitive approach is on changing the learner by encouraging him/her to use appropriate learning strategies.

The educator adopts mental representations of events and objects. He/she is passive in this interpretation of reality, since it is socially imposed and universally agreed upon. He/she is active in his decision to practice the new behavior. The educator processes symbols and grasps the meaning of the symbols. He/she is able to distinguish between the knowledge of concepts and the knowledge of the procedural steps involved with those concepts. His/her knowledge is organized in his schema.

Because of the emphasis on mental structures, cognitive theories are usually considered more appropriate for explaining complex forms of learning (reasoning, problem-solving, and information-processing) than are those of a more behavioral perspective. However, it is important to indicate at this point that the actual goal of instruction for both of these viewpoints is often the same: to communicate or transfer knowledge to the students in the most efficient and effective manner possible.

Two techniques used by both camps in achieving this effectiveness and efficiency of knowledge transfer are simplification and standardization. That is, knowledge can be analyzed, decomposed, and simplified into basic building blocks. Knowledge transfer is expedited if irrelevant information is eliminated. For example, trainees attending a workshop on effective management skills would be presented with information that is "sized" and "chunked" in such a way that they can assimilate and/or accommodate the new information as quickly and as easily as possible. Behaviourists would focus on the design of the environment to optimize that transfer, while cognitivists would stress efficient processing strategies.

Many of the instructional design strategies advocated and utilized by cognitivists are also emphasized by behaviourists, yet usually for different reasons. An obvious commonality is

the use of feedback (Ormrod, 1999). A behaviourist uses feedback (reinforcement) to modify behaviour in the desired direction, while cognitivists make use of feedback (knowledge of results) to guide and support accurate mental connections.

Learner and task analyses are also critical to both cognitivists and behaviourists, but once again, for different reasons. Researcher likes Striebel, 1995) believe that cognitivists look at the learner to determine his/her disposition to learning, (i.e., How does the learner activate, maintain, and direct his/her learning?). Additionally, cognitivists examine the learner to determine how to design instruction so that it can be readily assimilated (i.e., what are the learners' existing mental structures. Specific assumptions or principles that have direct relevance to instructional design include the following (possible current ID applications are listed in brackets following the listed principle):

- **Emphasis on the active involvement of the learner in the learning process learner control,**
- **Metacognitive training [(e.g., self planning, monitoring, and revising techniques)]**
- **Use of hierarchical analyses to identify and illustrate prerequisite relationships [cognitive task analysis procedures]**
- **Emphasis on structuring, organizing, and sequencing information to facilitate optimal processing [use of cognitive strategies such as outlining, summaries, synthesizers, advance organizers, etc]**
- **Creation of learning environments that allow and encourage students to make connections with previously learned material [recall of prerequisite skills; use of relevant examples, analogies]**

According to Huitt, (1999) cognitive theories emphasize making knowledge meaningful and helping learners organize and relate new information to existing knowledge in memory.

Instruction must be based on a student's existing mental structures, or schema, to be effective. It should organize information in such a way that learners are able to connect new information with existing knowledge in some meaningful way. Analogies and metaphors are examples of this type of cognitive strategy. For example, instructional design textbooks frequently draw an analogy between the familiar architect's profession and the unfamiliar instructional design profession to help the novice learner conceptualize, organize and retain the major duties and functions of an instructional designer. Other cognitive strategies may include the use of framing, outlining, mnemonics, concept mapping, advance organizers and so forth.

Such cognitive emphases imply that major tasks of the educator/designer include:

- (1) Understanding that individuals bring various learning experiences to the learning situation, which can influence learning outcomes;
- (2) Determining the most effective manner in which to organize and structure new information to tap the learners' previously acquired knowledge, abilities, and experiences; and
- (3) Arranging practice with feedback so that the new information is effectively and efficiently assimilated and/or accommodated within the learner's cognitive structure.

3.5 Conclusions

Cognitivism is a study of how learning occurs from a change in mental state. Cognitive psychologists contend that learning cannot be described in terms of a change in behaviour. Learning occurs whether or not there is an observable change in the learner. Cognitive theorists also believe that an instructor can produce learning by transferring information to the learner and helping them to organize it in such a way that they are able to recall it later.

This raises questions from the behaviourists who believe that learning only occurs from a stimulus - response relationship, using reinforcers to motivate the learner. Cognitivists also believe in reinforcement, but on a different level. They reinforce the learner through a process of retrieving existing knowledge and presentation of new information. They assess the learner's retention of the new information and provide feedback and cues for effective organization of the information. Throughout the learning process, the instruction is motivated through a kind of mental stimulation, not behaviour modification.

This theory also raises questions from the social learning theorists who believe that learning occurs through a modelling of behaviour, dependent on environmental factors. Again, Cognitivists would disagree, because behaviour is not a factor of learning. Learning occurs regardless of a change in behaviour. The environment could have an effect on the learning, but cognitivists believe that the instruction enables the learner to "look past" the environmental factors and organize the information that is important.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

A starting point in trying to understand the collection of information for research purposes is that there are broadly two approaches. Research methods can be classified in various ways; however one of the most common distinctions is between qualitative and quantitative research methods. Early forms of research originated in the natural sciences such as biology, chemistry, physics, geology etc. and were concerned with investigating things, which we could observe, and measure in some way. Such observations and measurements can be made objectively and repeated by other researchers. This process is referred to as “quantitative” research.

Much later, along came researchers working in the social sciences: psychology, sociology, anthropology etc. They were interested in studying human behaviour and the social world inhabited by human beings. They found increasing difficulty in trying to explain human behaviour in simply measurable terms. Measurements tell us how often or how many people behave in a certain way but they do not adequately answer the question “why?” Research which attempts to increase our understanding of why things are the way they are in our social world and why people act the ways they do is called “qualitative” research. The researcher used the **qualitative research** and little bit of **quantitative research** in this study of computer technology.

4.2 Qualitative research is designed to reveal a target audience's *range of behaviour* and the *perceptions that drive it* with reference to specific topics or issues. It uses in-depth studies of small groups of people to guide and support the construction of hypotheses. The results of qualitative research are *descriptive rather than predictive*. Qualitative research methods originated in the social and behavioural sciences: sociology, anthropology and psychology. Today, qualitative methods in the field of marketing research include in-depth interviews with individuals, group discussions (from two to ten participants is typical); diary and journal exercises; and in-context observations. Sessions may be conducted in person, by telephone, via videoconferencing and via the Internet (Qualitative Research Consultants Association, 2003).

The language of qualitative research is one of interpretive. Researchers discuss cases in their social context and develop grounded theories that emphasize tracing the process and sequence of events in specific settings. They explain how people attach meaning to events and learn to see events from multiple perspectives. Only rarely does one hear a qualitative researcher discuss variables or hypotheses. Qualitative researchers view many aspects of social life as being intrinsically qualitative. For them, qualitative data are meaningful, not deficient and central issues are not how to turn them into variables that can be expressed with objective numbers; rather "they concern such matters as the accessibility of other subcultures, the relativity of actor's accounts of their social worlds, and conception's of their action (Halfpenny, 1979).

After a general overview of qualitative research, philosophical perspectives, which can inform qualitative research, are discussed. Sections follow this on qualitative research methods, qualitative research techniques, and modes of analyzing and interpreting qualitative data. This

is then followed by a number of sub-sections that relate to qualitative research in general, i.e. citation lists, links to resources on the Internet for qualitative researchers, links to software tools and calls for papers. The motivation for doing qualitative research, as opposed to quantitative research, comes from the observation that, if there is one thing, which distinguishes humans from the natural world, it is our ability to talk! Qualitative research methods are designed to help researchers understand people and the social and cultural contexts within which they live.

For example, qualitative research is often said to be *naturalistic*. That is, its goal is to understand behaviour in a natural setting. However, quantitative research models and techniques may be used for the same purpose. Qualitative research is sometimes said to have as its goal the understanding of the sample studied, rather than generalizing from the sample to the population. However, quantitative research may also refrain from generalizing to the population (in education research for example, the ability to generalize is often extremely limited, and studies often restrict themselves to drawing conclusions about the sample studied). Furthermore, this goal does not account for the renunciation of statistical analysis, which helps researchers to understand samples.

Other descriptions which may be taken as descriptions of the goals of qualitative psychological research tend to stipulate that the research should be carried out in a certain way. That is, in these definitions qualitative research is not defined by its results (that is, functionally) but by its procedures (that is, causally). Qualitative psychological research is often said to be *inductive*. This seems to mean that the research is non-evaluative rather than that it depends on inductive logic in the usual sense. However, a reasonable argument could be made that quantitative research is often non-evaluative in the same sense. Qualitative

psychological research emphasizes fieldwork, and this emphasis has been offered as a distinguishing mark. However, quantitative researchers also do fieldwork (Wikipedia, the free encyclopedia 2005).

4.3 The nature of qualitative research

Qualitative research is concerned with developing explanations of social phenomena. That is to say, it aims to help us to understand the world in which we live and why things are the way they are. It is concerned with the social aspects of our world and seeks to answer questions about: Why people behave the way they do, how opinions and attitudes are formed, how people are affected by the events that go on around them, how and why cultures have developed in the way they have, the differences between social groups.

Qualitative research is concerned with finding the answers to questions which begin with: why? How? In what way? Quantitative research, on the other hand, is more concerned with questions about: how much? How many? How often? To what extent? Further features of qualitative research and how it differs from quantitative research are listed below:

- Qualitative research is concerned with the opinions, experiences and feelings of individuals producing subjective data.
- Qualitative research describes social phenomena as they occur naturally. No attempt is made to manipulate the situation under study as is the case with experimental quantitative research.
- Understanding of a situation is gained through a holistic perspective. Quantitative research depends on the ability to identify a set of variables.

- Data are used to develop concepts and theories that help us to understand the social world. This is an inductive approach to the development of theory. Quantitative research is deductive in that it tests theories which have already been proposed:
- Qualitative data are collected through direct encounters with individuals, through one to one interviews or group interviews or by observation. Data collection is time consuming.
- The intensive and time consuming nature of data collection necessitates the use of small samples.
- Different sampling techniques are used. In quantitative research, sampling seeks to demonstrate representativeness of findings through random selection of subjects. Qualitative sampling techniques are concerned with seeking information from specific groups and subgroups in the population.

4.4 Qualitative research designs

In this section, four major types of qualitative research design are outlined. They are: **Phenomenology, Ethnography, Grounded theory and Case study** (Yuen, Law, & Wong, 2003). Therefore, the researcher will use case study because it has qualitative and quantitative. The study concentrates on one institution and based on one topic.

4.5 Case study

Case study research is one of those research approaches which can take a qualitative or quantitative stance. In this resource pack, the qualitative approach to case study is described wherein the value of case study relates to the in-depth analysis of a single or small number of units. Case study research is used to describe an entity that forms a single unit such as a person, an organisation or an institution. Some research studies describe a series of cases. Case study research ranges in complexity. The most simple is an illustrative description of a single event or occurrence. More complex is the analysis of a social situation over a period of time (Ragin, 1994 & Newman, 2003).

According to Creswell (1998) as case of study can be regarded as an exploration or in-depth analysis of a bounded system bounded by time and/or place or a single or multiple cases, over a period of time. As Babbie (2001) points out there is little consensus on what may constitute a case or “bounded system in the words of Creswell. The case being studied can refer to a process, activity, event, programme or individual or multiple individuals. It might even refer

to a period of time rather than a particular group of people (De Vos, Strydom, Fouché, and Delport, 2002).

The exploration and description of the case takes place through detailed, in depth data collection methods, involving multiple source of information that are rich in context. These can include interviews, documents observations or archival records. As such the researcher needs access to, and the confidence of participants. The product of this research is an in-depth description of a case or cases. The researcher situates this system or case within its large context. But the focus remains on either the case or an issue that is illustrated by the case (Creswell, 1998) this implies, as Babbie (2001) points out, that case study researchers, in contrast with grounded theorists, seek to enter the field with a knowledge of the relevant literature before conducting the field research.

Mark (1996) refers to three types of case studies, all with different purposes.

The intrinsic case study is solely focused, on the aim of gaining a better understanding of the individual case. The purpose is not to understand a broad social issue, but merely to describe the case being studied.

The instrumental case study is used to elaborate on a theory or to gain a better understanding of a social issue. The case study merely serves the purpose of facilitating the researcher's gaining of knowledge about the social issue.

The collective case study furthers the understanding of the researcher about a social issue or population being studied. The interest in the individual case is secondary to the researcher's interest in a group of cases. Cases are chosen so that comparisons can be made between cases and concepts so that theories can be extended and validated.

Case studies help researchers connect them at a micro level, or the actions of individual people, to the macro level, or large-scale social structures and processes (Vaughan, 1992). The logic of the case study is to demonstrate a causal argument about how general social forces shape and produce results in particular settings. (Walton 1992). Case study research raises questions about the boundaries and defining characteristics of a case. Such questions help in the generation of new thinking and theory. Case studies are likely to produce the best theory (Walton, 1992).

The main reason for the researcher in using case study in this study is to get more information from the population that has been used for the sampling methods. Therefore, the researcher used the most popular instrument when conducting the case study researches, which are the following: interviews, documents observations or archival records and participation observation.

4.6 Research Instruments

In previous research design of this study, the researcher explains the instruments that are associated with case study, which are the following instruments: interviews, observation and document analyses.

4.7 Document analyses

A wide range of written materials can produce qualitative information. They can be particularly useful in trying to understand the philosophy of an organisation as may be required in action research and case studies. They can include policy documents, mission statements, vision and values, annual reports, minutes or meetings, codes of conduct, etc. Notice boards can be a valuable source of data. Researchers who use this method of data collection sometimes develop reputations as a “lurker” because of their tendency to lurk around notice boards! (Refer to the Appendix 1).

A valuable source of information in qualitative research can be documents. Documents consist of public and private records that qualitative researchers can obtain about a site or participants in a study and include newspapers, minutes of meeting, personal journals and letters. These sources provide valuable information in helping researchers understand central phenomena in qualitative studies. They are categorized into public and private documents. Examples of public documents are minutes from meetings, official memos, records in the public domain, and archival material in libraries. Private documents consist of personal journals and diaries, letters, personal notes, and jotting individuals write to themselves. Other

materials such as e-mail comments or web site data can be considered both public and private, and they represent a growing data source for qualitative researchers.

Documents represent a good source for text (word) data for a qualitative study. They provide the advantage of being in the language and words of the participants, who have usually given thoughtful attention to them. They are also ready for analysis without the necessary transcription that is required with observation or interviewing data. In general, written data include a wide range of pre-existing texts that the researcher collects as part of a study. For example:

Policy documents

- Official and unofficial records (e.g. attendance rolls, pupil records, specialists' reports);
- Documents generated originally for personal purposes (e.g. letters, notes passed in class, student work);
- Historical documents (e.g. letters and diaries written by people who are significant for understanding past events, as well as old newspapers, posters and magazines);
- Television doc and adv;
- Textbooks and other text-based school resources

4.7.1 Collecting Documents

With so much variation in the types of documents, no common procedure can be easily described. However, here are several used guidelines for collecting documents in qualitative research:

- Identify the type of documents that can provide useful information to answer the qualitative research questions.
- Consider both public and private documents as sources of information for qualitative research.
- Once the documents are located, seek permission to use them from the appropriate individuals.
- If participants are asked to journal, provide specific instructions describing how they should go about it. These guidelines might include what topics and format to use, the length of journal entries, and the importance of writing their thoughts legibly.
- Once permission to use documents is granted, examine the documents for accuracy, completeness, and usefulness in answering the research questions in your study.
- Record information from the documents. This process can take several forms, including taking notes about the documents, or, if possible, optically scanning them so a text (or word) file is created for each document.

Collecting personal documents can provide a researcher with a rich source of information. For example, consider a study that used computer technology journals.

4.8 Participation observation

One of the most common methods for qualitative data collection, participant observation is also one of the most demanding. It requires that the researcher become a participant in the culture or context being observed. The literature on participant observation discusses how to enter the context, the role of the researcher as a participant, the collection and storage of field notes, and the analysis of field data. Participant observation often requires months or years of intensive work because the researcher needs to become accepted as a natural part of the culture in order to assure that the observations are of the natural phenomenon. When educators think about qualitative research they often have in mind the process of collecting observational data in a specific school setting. Unquestionably, observations represent a frequently used form of data collection with the researcher able to assume different roles in the process (Spradley, 1980).

Observation is the process of gathering first-hand information by observing people and places at a researcher site. Unlike quantitative inquirers, qualitative inquirers do not use instruments developed by other researchers; rather, they design their own data-gathering observational forms. These forms are “unstructured” in that they do not rely on predetermined questions or scales, as do forms used in quantitative research. Using these unstructured forms, researchers record data such as the behaviours of individuals, chronological lists of the sequence of events, physical diagrams depicting the setting, and specific quotes of individuals (Creswell, 2002).

Not all qualitative data collection approaches require direct interaction with people. It is a technique that can be used when data collected through other means can be of limited value or is difficult to validate. For example, in interviews participants may be asked about how they behave in certain situations but there is no guarantee that they actually do what they say they do. According to Babbie, (1992) observing them in those situations is more reliable: it is possible to see how they actually behave. Observation can also serve as a technique for verifying or nullifying information provided in face-to-face encounters.

Other researchers such as Gall, Borg & Gall (1996) look as, in some research observation of people is not required but observation of the environment. This can provide valuable background information about the environment where a research project is being undertaken. For example, an action research project involving an institution may be enhanced by some description of the physical features of the building. An ethnographic study of an ethnic population may need information about how people dress or about their non-verbal communication. In a health needs assessment or in a locality survey observations can provide broad descriptions of the key features of the area. It can describe the key components of the area: the main industries; type of housing. With Montgomery & Duck (1991) the availability of services can be identified: number, type and location of education care facilities such as technical colleges and training centres; leisure facilities; shopping centres.

The researcher can collect data by observation when the researcher makes a visit to anywhere that is appropriate to his research: (educational institutions, a nursery, a residential home, a factory, a building site, an office, a shopping centre, etc), but this study is based on an educational institution. The researcher will think and plan the questions the researcher is looking for answers; and thinks about and plan the methods of recording, storing and

retrieving the material. It is not always convenient or acceptable to make notes as you go along so a useful technique is to write a report of what you have heard and seen *immediately afterwards*.

The researcher observes the educators in the classroom situation, while they present their lesson. The researcher will use the video camera if it is suitable to the classroom environment. He will look at the participation of the students as well as the classroom environment where the teaching and learning process occurs (refer to the Appendix 2).

4.9 Interview method

Equally popular to observation in qualitative research is interviewing. Conducting a qualitative interview is the process where researchers ask one or more participants in study mostly general, open-end questions and record their answers. This information is then transcribed or typed into a data file for analysis (Creswell, 2002).

Distinct from quantitative interviewing, the qualitative inquirer does not use an instrument with specific, predetermined scales. Instead, researchers ask a small number of open-ended questions that permits the participants to answer from their point of view. According to (Creswell, 2002), there are three types of interviews: Structured interviews, unstructured interviews, and Semi-structured interviews.

In addition to structured and unstructured interviews, semi-structured interviews are used in both quantitative and qualitative research. In semi-structured interviews, the researcher asks some questions that are close-end and some questions that are open-ended. The advantage of

this interviewing is that the predetermined closed-ended responses can net useful information to support theories and concepts in the literature. The open-ended responses, on the other hand, can allow the participant to provide personal experiences that may be outside or beyond those identified in the closed-ended options. For example, a researcher might ask a closed-ended question followed by an open-ended question (Creswell, 2002).

The researcher is looking at the depth of information then he will give attention to the most useful interview format for conducting qualitative research is often “semi-structured interviews” (sometimes called “moderately scheduled”). This means the interview is not highly structured, as is the case of an interview that consists of all closed-ended questions, nor is it unstructured, such that the interviewee is simply given a license to talk freely about whatever comes up. Semi-structured interviews offer topics and questions to the interviewee, but are carefully designed to elicit the interviewee’s ideas and opinions on the topic of interest, as opposed to leading the interviewee toward preconceived choices. They rely on the interviewer following up with probes to get in-depth information on topics off interest. Semi-structured interviews are conducted with a open framework which allow for focused, conversational, two-way communication. They can be used to both give and receive information. Two underlying principles of the following suggestions are (1) strive to avoid leading the interview or imposing meanings, and (2) strive to create relaxed, comfortable conversation (Zom, 2002).

Semi-structured interviews use a combination of interviewer experience and pre-interview planning. One advantage of the semi-structured interview is the flexibility to explore areas of questions as they arise during the interview process. The main disadvantages of the semi-

structured interview approach are that important areas of questions may be missed or illegal questions may be asked spontaneously.

Often the information obtained from semi-structured interviews provides not just answers, but the reasons for the answers. When individuals are interviewed, they may more easily discuss sensitive issues (refer to the appendix 3).

The researcher uses the tape recorder and video recorder for the interviews of the participants in the study. Each day the researcher will do a transcription of the tape that has been used for the interviews.

4.10 Methodology sampling

Determination of required sample size is a very important task in many spatial problems, since the accuracy of estimations about the population is dependent on the sample size. Although, there are some rules of thumb on the required sample size in conventional data analysis (Walfond, 1995), when sampling frame is spatial the optimum sample size relies on the area of concern.

The sampling methods are divided into two categories such as, **probability and non-probability sampling** (Schofield, 1996). The non-probability sampling is based on subjective judgment, while the probability sampling uses random chance as determining factor for an observation to be involved in the sample (Walford, 1995). The difference between them is this: in a probability sample the chance of members of the wider population being selected for the sample are known, whereas in a non-probability sample the chance of members of the wider population being selected for the sample are unknown.

In the former (probability sample) every member of the wider population has an equal chance of being included in the sample; inclusion or exclusion from the sample is a matter of chance and nothing else. In the latter, (non-probability sample) some members of the wider population definitely will be excluded and others definitely included (i.e. every member of the wider population does not have an equal chance of being included in the sample). In this latter type, the researcher has deliberately, purposely, selected a particular section of the wider population to include in or exclude from the sample (Cohen, Manion and Morrison, 2002).

Qualitative researchers focus less on a sample's representativeness or detailed techniques for drawing a probability sample. Instead, they focus on how the sample or small collection of cases, units, or activities illuminates social life. The primary purpose of sampling is to collect specific cases, events, or actions that can clarify and deepen understanding. Qualitative researchers' concern is to find cases that will enhance what other researchers learn about the process of social life in a specific context. For this reason, qualitative researchers tend to collect a second type of sample non-probability sampling (Lane, 2003).

The researcher on this study of computer technology is concentrated only on non-probability sample because he is using only the educators that are specializing on computer technology as a subject, not every educator in the FET College have a chance of being included in sample. Most of the FET Colleges has two or three educators, which are, specialize in computer technology as a subject.

4.11 Non-Probability Sample

Qualitative researchers tend to use non-probability or non-random sample. This means they rarely determine the sample size in advance and have limited knowledge about the large group or population from which the sample is taken (Neuman, 2004). According to (Cohen, Manion and Morrison, 2002) the selectivity which is built into a non-probability sample derived from researcher targeting a particular group, in the full knowledge that it does not represent the wider population; it simply represent itself. This is frequently the case in small scale research, for example, as with one or two schools; two or three groups of students, or a particular group of educators, where no attempt to generalize is desired; this is frequently the case for some ethnographic research, action research, or case study research.

There are several types of non-probability sample that are used in education research: convenience sampling, quota sampling dimensional sampling, purposive or judgment sampling snowball sampling and etc. each type of sample seeks only to represent itself or instances of itself in a similar population, rather than attempting to represent the whole, undifferentiated population (Cohen, Manion and Morrison, 2002).

Purposive sampling is the suitable sample that is use by the researcher in this study of perception of educators towards the use of computer technology in FET Colleges. There are few educators which are teaching computer technology as a subject in FET Colleges that make the sampling to be only educators with information about the computer technology as a subject.

The researcher of this study will use probabilistic sampling because; it has advantages over non-probabilistic sampling since it ensures that all the population members have equal chance of being included in the sample. The researcher of this study will concentrate on the probability sampling

According to the researchers Easton, & McCall's, (1997) each individual is chosen entirely by chance and each member of the population has no equal chance of being included in the sample. Every possible sample of a given size has the same chance of selection; i.e. each member of the population is equally likely to be chosen at any stage in the sampling process

4.12 Purposive or Judgment Sampling

Purposive sampling is acceptable kinds of sampling for special situations. It uses the judgment of an expert in selecting cases or it selects cases with a specific purpose in mind (Neuman, 2004). According to Babbie1998 purposive sampling, researchers handpick the cases to be included in the sample based on their judgment of typically. In this way, they build up a sample that is satisfactory to their specific purpose. Whilst it may satisfy the researcher's needs to use this type of sample, it does not pretend to represent the wider population; it is deliberately and unashamedly selective and biased (Cohen, Manion and Morrison, 2002).

With purposive sampling, the researcher never knows whether the cases selected represent the population. It is used in exploratory research or in field research. Purposive sampling is appropriate in three situations. First, a researcher selects unique cases that are especially informative. The researcher wants to use the educator's perception to study computer technology. He selects a specific population of computer technology educator that can be used for the study because it is trend setting (Grosos and Sardy, 1985). Second, a researcher may use purposive sampling to select members of a difficult-to-reach, specialized population. Another situation for purposive sampling occurs when a researcher wants to identify particular types of cases for in-depth investigation. The purpose is less to generalize to a larger population than it is to gain a deeper understanding of types.

The research term used for the qualitative sampling approach is called purposeful sampling. In purposeful sampling, researchers intentionally select individuals and sites to learn or understand the central phenomenon. The standard used in choosing individual and sites is whether they are “information rich” (Patton, 1990, p.169). Further the word “individuals” and “sites’ are carefully chosen. In any given qualitative study, you may decide to study a site (e.g. one college campus) several sites (three small computer laborite campuses), individual or groups (educators), or some combination (purposefully sample two computer laborite and several educators on those campus). Purposeful sampling thus applies to both individuals and sites.

There are different types of sampling that are used in qualitative and quantitative research in nowadays. But the researcher of this study is using the purposive or judgment sampling for this research. They are four campuses at SS FET College, and the researcher will take purposive selection of three educators per campus with information in computer technology as a subject. That makes 12 participants on researcher’s study in all, as stated in the case study that participations must be more than 10.

CHAPTER FIVE

FINDINGS

5.1 *Introduction*

The findings of this study come from the research that has been done in one of the FET Colleges surrounding Durban. This FET College has four campuses; only three of them use computer technology in teaching technical subjects. The findings are the result from the research in these campuses using or with the help of twelve (12) educators.

In campus A the research involves four educators, while in campus B he uses three and in campus C he uses three educators who were available and involved in the computer technology during the time of conducting of this study

5.2 Syllabus

The researcher used the following syllabus for the computer related subjects (Duration of syllabus: date of issue of syllabus). Information system composed by the following subjects: Computer Practices, International Computer Driving License (ICDL) & Computer Literacy.

	Educator	Campus	Syllabus	Issue Dates	Gender	Comments
Computer Practices	3	A	Yes/all	1992	Females	Classroom arrangements
ICDL	3	B	Yes/All	2000	Females	Conducive
Computer Literacy	6	A, B & C	3Yes & 3 No	2001	Females	Deterioration

Table 1: Computer subjects

The above table 1 shows that 6 (six) of educators from campus A and B, have their syllabus and their classroom were arranged in order. 3 (three) of the educators from campus C do not have syllabus and their classroom deteriorated. All educators in this study were females.

5.2.1 *Scheme of work for Computer syllabus at: A, B & C*

40% of educators have the correct equipment for the scheme of work and they use it for the daily report in a professional way, while 40% do have it and are not using it in a correct manner. 20% do not have it and they did not know what it is that, they do not even have the records for the year plan for their subjects. They do not have an understanding that the computer software can be used for storage of important documents like scheme of work for a day or year plan for the syllabus.

5.2.2 *Educators timetable (Class timetable with the number of hours per day or week)*

Educators from all campuses have their own time table that they follow during the working hours and they work according to the time table, but 30% of educators arrive later in the classroom and then leave earlier than the actual time for the lesson. 60% keep the time for the lesson, as this is important to them and profitable to the learners. 10% sometimes arrive early and some days they arrive late.

5.2.3 Records for computer services & maintenance

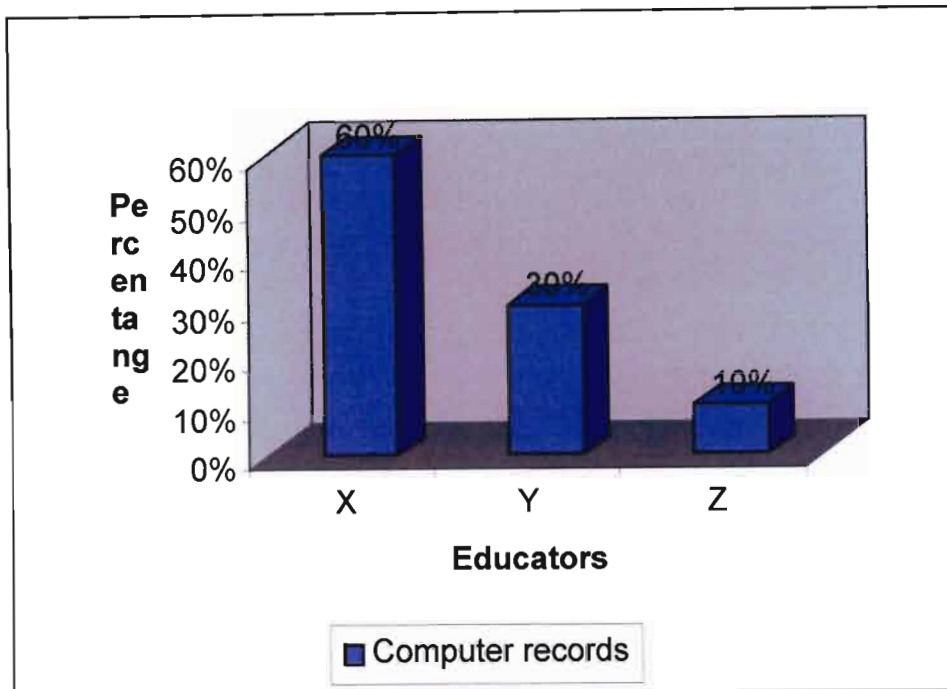


Figure 3: Computer records

With reference to the above figure 3, 60% of educator feels that to keep records for computers is their own business, and that it helps them for the smooth running of the class. While the other 30% feel that to keep the records for the computers is for the technicians not for them, their task is to teach the learners to use the computer and not to repair computers and the college must employ more technicians with higher qualifications to do the repairs. 10% of the educators they do not care whether they have the records of the computers that are not working because they feel that the technicians take their time to return the repaired computers. They also feel that when you report the computer problems to the technicians, the response from the technicians is not acceptable, as if you learners always misuse the computers as if they told the learners to do so.

5.2.4 Records for number of computers in the classroom

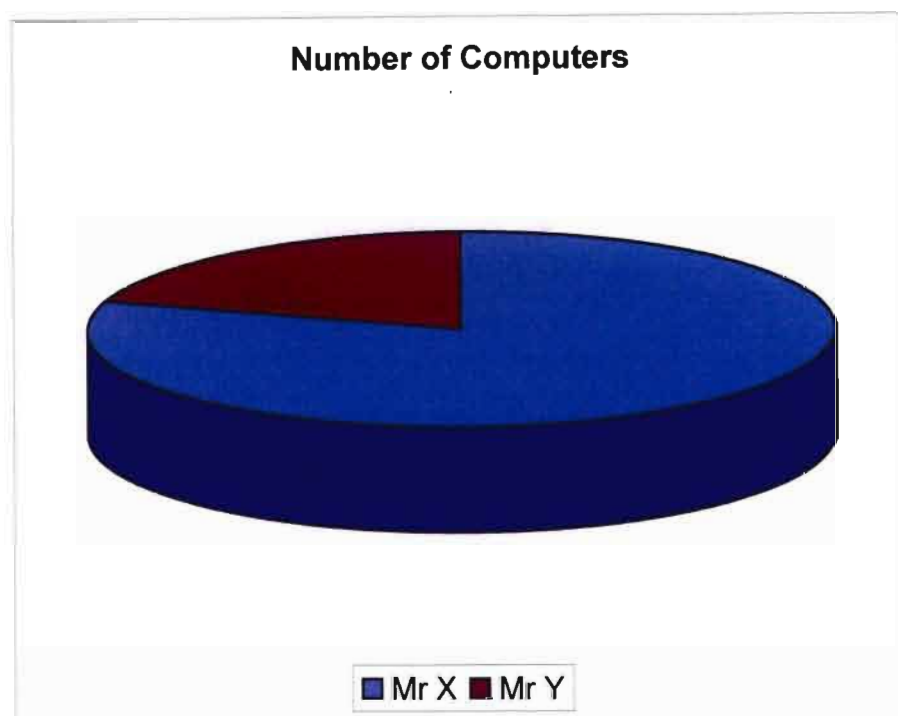


Figure 4: Number of Computers in classroom

According to the above figure 4 shows that 80% of the educators feel that the number of computers in the classroom must be equal to the number of learners or with two to three in case one computer malfunctions. 20% of educators need special types of computers not just a computer for learning but a computer with extra-ordinary software.

5.2.5 Classroom arrangement or classroom planning

70% of educators do not have a plan for the classroom arrangement and it is difficult to change the classroom suitable to your style. 30% of educators don't care about the arrangement of the class as long as they are teaching. They also share classrooms between educators and that makes the educator less responsible for the conditions of the classroom.

5.2.6 Records of computer application software programs that are used

Campus	Software	Year	Programs	Conditions
A	Microsoft	2000	All Microsoft programs	Good
B	Microsoft	2000	All Microsoft programs	Deterioration
C	Microsoft and Pastel	1998-2000	All Microsoft programs	Not acceptable

Table 2: Records of Computer Application software

According to table 2, 2 of the campuses use Microsoft application software and their computers were in good condition. One of the campuses uses Microsoft application software with Pastel.

5.2.7 Daily records for the learner's attendance register

60% of the educators keep daily records of the learner's progress and retained it until the end of the year, because the computer courses run according to year and semester courses. 40% of educators do not keep the records of the learners because they say that they do not have the record book for the learners.

5.2.8 Educator's resources for presenting the lessons

40% of educators use the computer as a resource for teaching during the presentation of lesson and they do have a printer, floppy disks and hardware for saving their work and they even use Internet, therefore they are in the information age of technology which is high technology. 40% of educators use the overhead projector (OHP) chalk board, charts, and textbook for the presentation of lesson (lower technology). 20% of educators don't have the presentation equipment that is in place, they use no technology in the presentation of their lessons.

5.2.9 Previous year's records

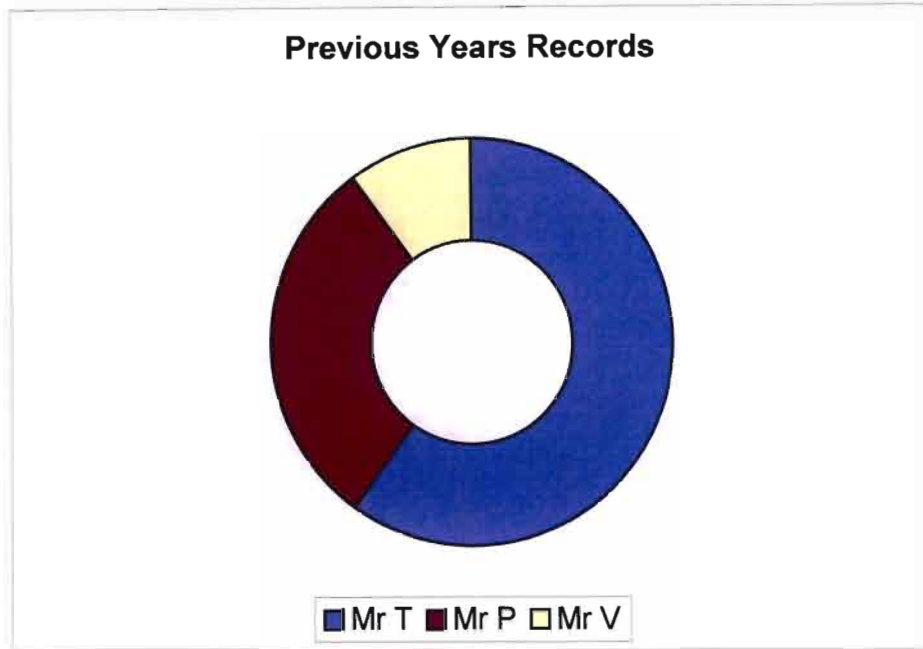


Figure 5: *Previous year's records*

With the reference to the above figure 5, 60% of educators do not have all documents with the previous results for the past three years. 30% of educators have the records but not enough for all previous three years, and 10% have everything in order and the campus manager's commend their records.

5.3 Observation

The researcher used the following methods of observation for collecting the data for this study. He recorded observations of the people, a situation or an environment by making notes of what has been observed.

5.3.1 Classroom environment

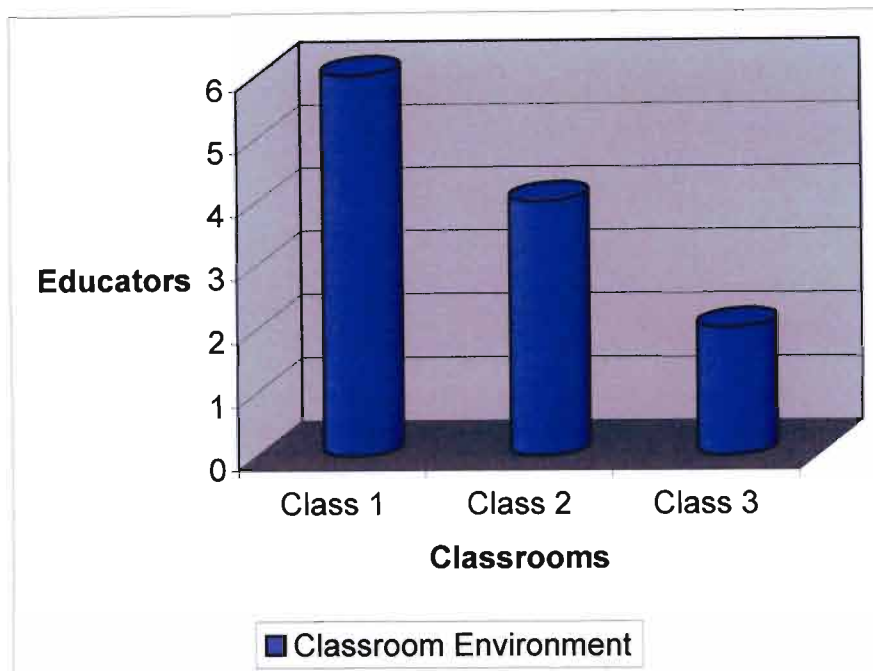


Figure 6: *Classroom Environment*

Figure 6 shows that 6 of the educator have a classroom environment that is conducive for learning, with charts of computer application software and the computer hardware on the walls that show that this is a computer room and will enhance the learning for the learners. All air conditioning is working which makes the classroom environment acceptable to the learners. The furniture that was used by learners like chairs and

computer tables are conducive for the learning process to occur. 4 of the educator's, classrooms have a few charts on their walls, which doesn't enhance the learning in the classroom and even their chairs are not acceptable for the learning process. 2 of the educator have no classroom; they share classroom with other educators.

5.3.2 Computer conditions

4 of the educators have the old type of computer and use old programs for teaching the learners, and the speed of those computers is very slow. 8 of the educator have the latest model of computer with a very high speed and acceptable conditions. The monitors that are used for learning are 15 inches and they have modernized hardware like mouse's and keyboards. 60% of the equipment in the computer technology classroom was conducive to the learning process and the other 40% were not conducive to the learning process. The learners have access to the computer technology to enable them to acquire the skills of using the computer technology for long-term purposes. The equipment was learner friendly (user friendly). Wall charts also communicate with the student about computer technology as a subject.

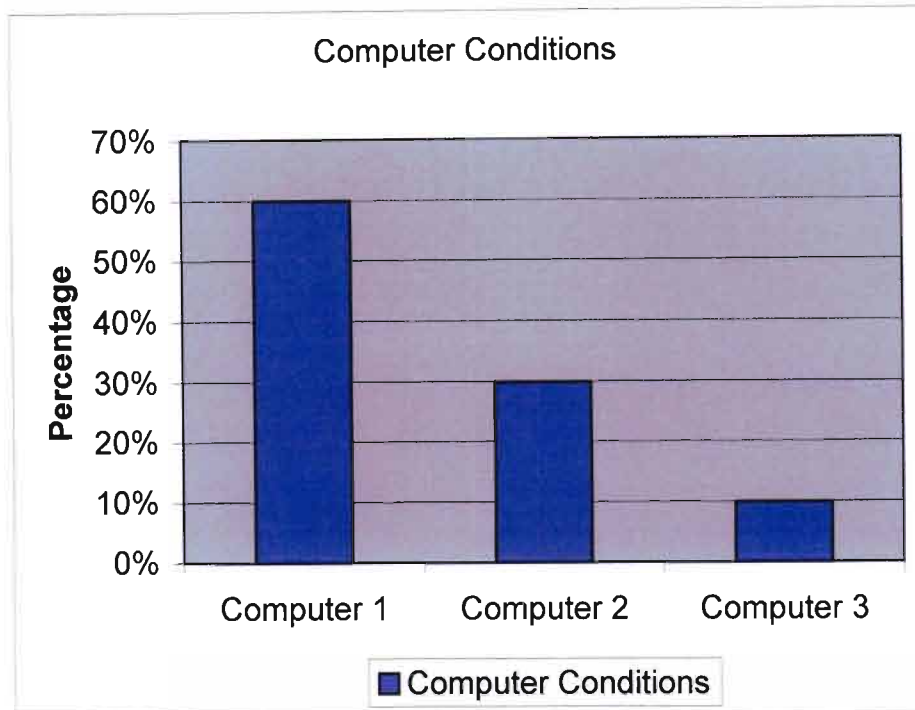


Figure 7: *Computer Conditions*

Figure 7 shows that 10% of educators of computer technology had more than one textbook which are used for the learning or for preparing the lesson for presentation. Educators had different tools for presenting the lesson to the learners. With the right equipment, the educators had more chances to achieve the desired outcome of the lesson. 30% of computer rooms do not have sufficient air conditioning to cool the temperature of the classroom and the heat that is generated by the computers is not conducive for working or for the computers. 60% of computer classrooms have a sufficient cooling system and the walls of the classroom must display pictures which show the internal part of the computer and different types of computers and also a lot on the computer utility

5.3.3 Presentation

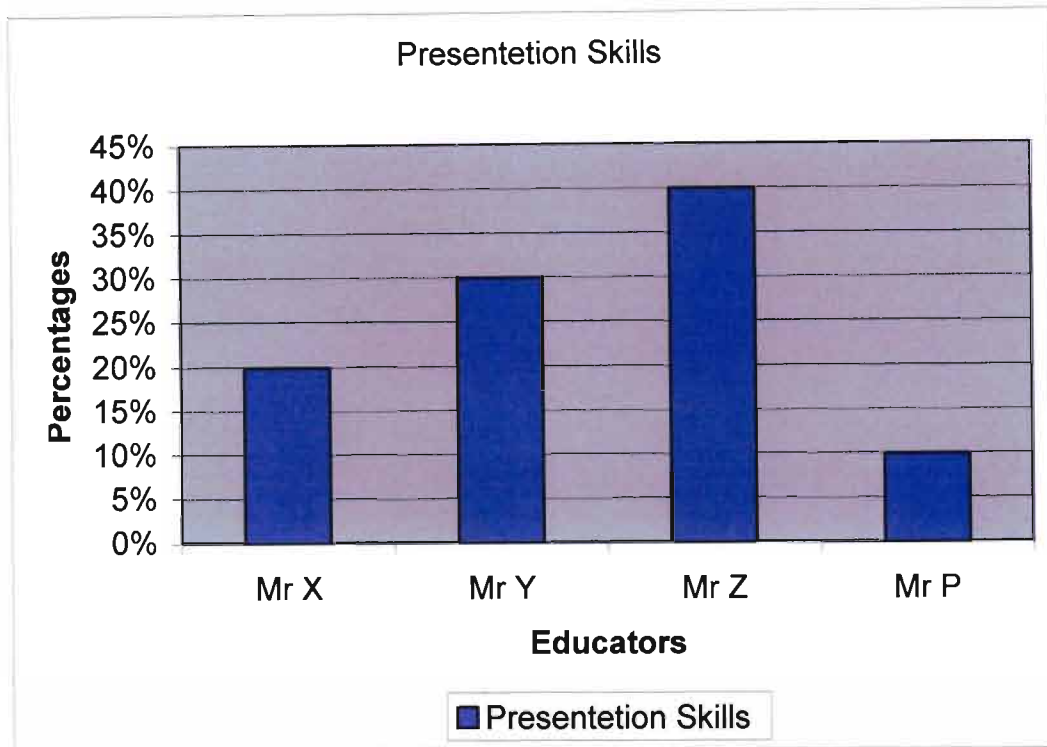


Figure 8: *Presentation Skills*

Figure 8 shows that 20% of educators used grouping methods of teaching, 30% used the lecturing methods and 40% used the discovering method. Educators that used the above method usually use the sense of hearing and the sense of touch so that the learner can develop the skills of the computer technology. Skills of using computer technology when developed effectively can last for long therefore the long-term memory is achieved. 10% of the educators used outdated methods of teaching. Those educators were not using the right way of the sensory stage of learning to educate the learners.

50% of educators have sufficient equipment to deliver the lesson to the learners, windows 2000 and the entire computer network to the central printer, which is based in each classroom and also connected to the entire network, while 30% of educators have windows 98; the other 20% have a mix of windows from 98 to 2000. The entire programs that are used were base on Microsoft Office software only. The Microsoft programs that are used are Power Point presentation, Excel, word processing, Access and Internet explorer.

5 of the educators used the computer as a resource for teaching during the presentation of lesson and they have a printer, floppy disks and hardware for saving their work and they even used internet, therefore they were in the information age of technology which is high technology. 5 of educators use the over head projector (OHP) chalk board, charts, and textbook for the presentation of lesson (lower technology). 2 of educators do not have the presentation equipment that is in place, they use no technology.

The presentation of subjects to the learners by the educators has an impact on the learners. While other educators show no interest in the subject, others have a passion for the subject, such that they will go the extra mile to help their learners. Some of the educators are so creative, such that they create extra work for themselves and extra communication time with the learners.

The educator was able to identify whether the learning has occurred during the presentation of the lesson in the classroom. The educator was able to control his/her personality during presentation, when there is many negative aspects that hinder the smooth progress of his/her presentation, which means that the educator's classroom ethics to control the class, leaves much to be desired.

5.3.4 Learners response

Communication	Good	Acceptable	Not acceptable
Educators	7	3	2

Table 3: *Communication between educators and learners*

With reference to the above Table 3, 7 of the educators personality was accepted to the learners that made the learning to be very important, because the learners were able to communicate with the educator to promote a two way communication in the classroom. 3 of educators had minimal communication between them and the learners during the lesson, thus leaving educators with little or no feedback as to whether the lesson was successful or not. 2 of the educators were interested in covering the syllabus, and not necessary interested in to making the learners understand the content of the lesson so that they are able to apply the knowledge that they gain for future purposes. The main purpose of the educator should be to make the learners able to implement what he/she has learnt in a practical situation.

5.3.5 Outcomes of teaching

When the learners have acquired the knowledge and the skills of computer technology beyond the scope of lesson, the educator uses all the sensory stages to achieve his/her outcome of the lesson so that the learners are able to identify their skills or knowledge of computer technology from the right sense.

5.4 INTERVIEWS

5.4.1 Introduction

The intention of the following interview questions was to gather information in the form of stories, anecdotes and narratives beyond the answers of the questions. Because of the semi-structured nature of these interviews, the wording changed based on the completeness and nature of the participant's response. Using perception as a value indicator in the interview process within the boundaries of the study, researcher attempted to follow the perception of the individual being interviewed as an active listener, injecting questions such as "What was that like?", "How did you feel about that?" and "Could you give me an example?" as appropriate to the interview response. In addition, where appropriate, I related the written work of an educator perception to the questions being posed. In some instances educators' perception became so enthusiastic in their responses that not all questions were addressed directly.

5.4.2 Related Background (Experience)

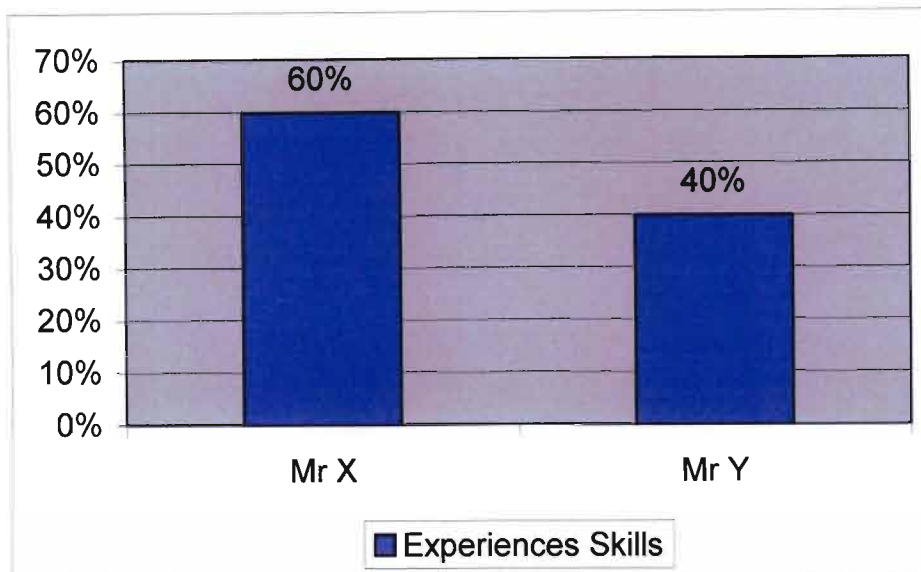


Figure 9: *Experiences Skills*

Figure 9 shows that 60% of the educators have extensive experience in computer technology, but the experiences were not relevant to teaching the computer technology as a subject. 40% of educators were inexperienced in use computer programs such as Word Processing, Power Point, Excel Access and most importantly, the use of Internet as a teaching tool in computer technology.

5.4.3 A common language between the participant and the interviewer (Understanding of Computer technology)

7 of the educators had understood the term computer technology and the meaning to education. On the other hand 3 of the educators do not have an idea of what the term information technology meant, they said it was educational technology or something to do with technology subjects.

5.4.4 Questions geared at investigation educator knowledge and passion in relation to CT

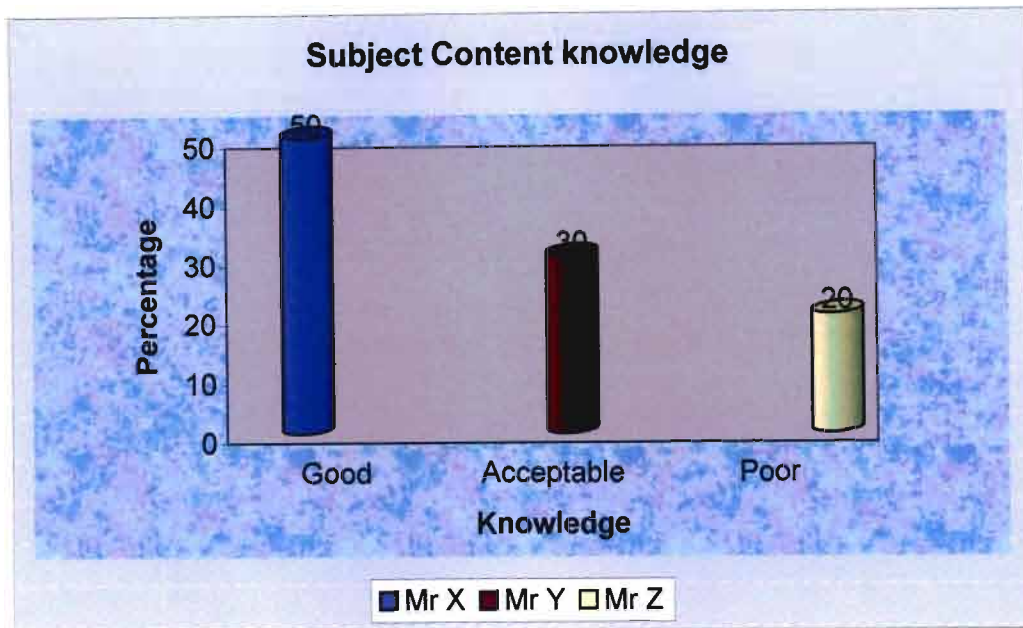


Figure 10 Subject content Knowledge

Figure 10 above illustrates the knowledge of the subject content of computer technology in terms of percentage: 20%, 30% and 50%. 20% of educators who come from the previously disadvantaged backgrounds have a minimal basic knowledge about the content of the subject as a tool or as subject matter. 50% of those coming from the other groups have more knowledge and better understanding of the subject. 30% of the educators do not understand computer technology as a subject, but only understand part of the program that is used in the computer such as the word processing program only, thus the educator's ability to use other programs is limited. Educators are supposed to upgrade their content knowledge of the subject. Some of the educators are not interested in upgrading their knowledge and skills of computer technology, while computer

technology advances almost each year. Learners taught by educators who have little knowledge suffer most.

5.4.5 Skills and values of education

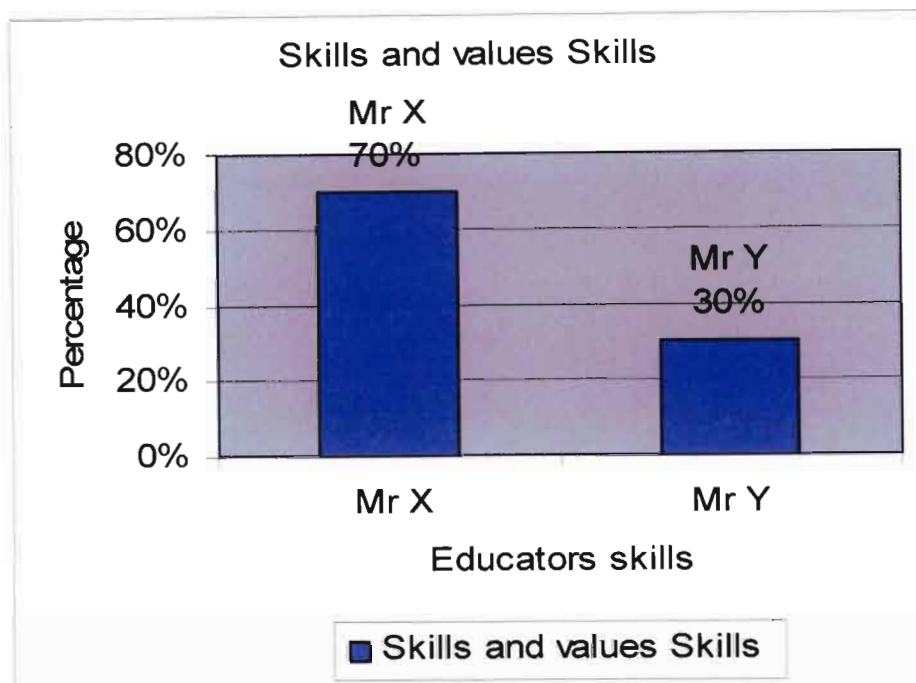


Figure 11: *Skills and values*

Figure 11 shows that the skills of educators that use computer technology properly are 70%, that is the use of the keyboard, mouse and who are able to demonstrate the operation of the computer using appropriate procedures, and those that are able to use it properly are 30%.

With the right skills of using computer technology, the learners show in the feedback to the educator that was positive or negative. The skills of educators that used computer technology properly were 70%, which is they used the keyboard; mouse and being able to

demonstrate the operation of computers in a good procedure and those that were able to use it properly are 30%. To be a computer technology educator did not require only the computer basic skills but also a passion for computers. It was very important for the learners to be able to demonstrate the skills of using computer technology as their response to their educator. If the learners generate short-term understanding that shows that, the learner cannot use computer technology as lifelong learning skills.

5.4.6 Educator's motivation on other educators'

8 of educators were motivated by seeing the effectiveness as the learning process occurs, when the learners were able to demonstrate what they had learnt during the presentation of the lesson. Demonstrations can show the skills of using computer technology or the knowledge of using computer technology. 4 of the educators want to achieve the positive outcomes of their lesson by getting good result from the learners (e.g. test marks, response of the learners during the presentation or examination marks). However, if you look at the programs that run during the evening and Saturdays, examined by the external examiner, true reflection of the outcome is not clear/evident. Most of the learners come from the African community, a poor community that cannot afford to buy computers for their home. This causes the learners not to be able to do their homework at home because they do not have computers.

5.4.7 Conclusion

The validity and the reliability of the study were limited to the honesty of the participants' responses to the instruments used in this study. Since the perceptions may change according to the environment and experiences, repeatability may not be possible. In one campus the data was collected from long service educators rather than inexperienced educators (since inexperienced educators were excluded from the pilot study). Also, the numbers of educators in each campus were different.

Even though the same researcher collected the data and tried to standardize the procedure of data collection, there could be some differences in the experimental treatment toward the participants during the administration of the observation and during the interviews.

Participants' conceptions of *computer technology with educational features* may be different. It is possible that some participants considered only *educational technology* when they responded to the questions.

5.5 Discussion of Findings

5.5.1 Introduction

The findings of this study highlight the contextual factors associated with perception of educators towards the use of computer technology in teaching technical subjects. Results suggest that a variety of factors interact to the contribution and the phenomenon of the educator's perception towards the use of computer technology. It will also explore how supportive classroom environments can be developed to displace some of the myths learners develop over the years. Recent theories suggest that cognitivism approaches to teaching and learning foster active learning in learners.

Results obtained from some research are meaningless unless compared and contrasted with the findings of other researchers in the field. This chapter attempts to validate the results by determining their significance against the results obtained by other researchers.

5.5.2 Interpretation of findings

In the findings, the researcher finds that 40% of the educators do not prepare the learning environment in such a way that sensory is used during the learning process in the classroom. With the theory of cognitivism, some learners are good in hearing; therefore the educators must use audio (e.g. delivery the lesson verbally, use TV or anything that the learner use for hearing sensory). Other learners learn more effectively in an

environment that they are able to visualize the content of the subject (e.g. charts on the walls, sketches by the educator on the board and the sketches in the textbooks). In the above findings, 30% of educators use the traditional way of teaching; therefore, educators do not use computer technology because they have a negative perception towards the use of computer technology in teaching technical subjects. The learners would not be able to communicate or compete with other learners from developed countries.

The researcher found that it is their [educators'] choices of how; when, where, why and by whom computer technologies are used that determine whether the technological pull is educationally beneficial. Research found that some of educators are not using the computer technology as a tool for enhancing teaching and learning but they use files. Although computer availability is important, the most important factors determining whether educators use computers effectively are planning time and educator perceptions, style and background.

He also found that to be a computer technology educator does not require only the computer basic skills but also passion for the computer. It is very important for the learners to be able to demonstrate the skills of using computer technology as their response to their educator. If the learners generate short-term understanding that shows that the learner cannot use computer technology as lifelong learning skills.

According to the literature review of this study the perception of using computer technology can be negative if the educator has this: "Perceived benefits" implying that

whether or to what extent one uses technology depends on personal understandings about whether or to what extent the use of the technology helps meet important individual goals. For example, one of the perceptions that fuel the current push for educational uses of the Internet is that it can engage students in authentic tasks.

Among educators there are those who are often resistant using computer technology in the classroom, so the development of educators' negative perceptions towards computer technology is considered to be a key factor in fostering computer integration and the enhancement of quality learning and teaching using computer technology, as this has been stated by the researchers (Yuen, Law & Chan, 1999).

5.5.3 Experience

The research found that other educators who grew up learning technical subjects using the traditional methods tend to question the role of computer technology and feel insecure in the integrated form of teaching and according to Hazzan (2000) that causes the educator to have negative perception towards the use of computer technology in the technical subjects. Slough and Chamblee (2000) also reported that educators who have a positive experience in using computer technology to do their work tend to teach their students with computer technology.

5.5.4 Knowledge of computer technology

The researcher found that an educator's knowledge of computer technology does not always match his or her perception of the computer technology role, making it difficult to use technology in the classroom. The researchers, Slough and Chamblee, (2000), stated that another barrier is the perception of technology as something unstable and always changing. When perceiving technology as such, educators are less likely to integrate technology with technical subject curriculum.

The research also found that educators report their lack of knowledge of methods to integrate technology and the lack of knowledge about technical subject's curriculum as the reasons for the little use of technology in their classrooms have negative perception towards the use of computer technology. A research study by Ertmer, Addison, Lane and Ross (1999) found that the educator's perception of the role of technology (what it should do in the classroom) was closely related to how the educator uses the computer technology.

The researcher also found that the educator's knowledge about computer technology also affects their perception of integration, which in turn affects their decision to use it. In other words, as the researcher (Coffland, 2000) stated in his research that educators who have higher awareness of technology tend to have better perception toward using technology. However, the lack of knowledge about hardware and software is a common

barrier in the literature (Weber, 1996). Lack of knowledge of computer technology is only part of the problem.

5.5.5 Skills of using a computer

The researcher found that, according to the research that has been done in this study most of the educators have the skills of using computers, but their skills are sometimes not relevant to the lesson. Lawton & Gerschner (1982) stated that the successful use of computer technology in the classroom depends on the educators' perceptions towards computer technology. Gressard and Loyd (1985) found that the perceived usefulness of computer technology can influence perceptions towards computer technology, and the amount of confidence an educator possesses in using computer technology may influence his or her implementation in the classroom. With the lower skills of the educators to use the computer lead to educators' perceptions has not being emphasized in the implementation of ICT the classroom. Though studies stated that educators' perceptions as well as knowledge and skills in using computer technology are major factors affecting their initial acceptance of computer technology and their future behaviour regarding computer usage (Violato, Mariniz & Hunter, 1989; Koohang, 1989).

5.5.6 Outcomes of teaching

According to the cognitive theory the researcher found that other educators emphasize making knowledge meaningful and helping learners organize and relate new information

to existing knowledge in memory. Other educators found that their instructions were based on a student's existing mental structures, or schema, to be effective. Other educators are organizing information in such a way that learners are able to connect new information with existing knowledge in some meaningful way, in order to have skills. Analogies and metaphors are examples of this type of cognitive strategy. For example, instructional design textbooks frequently draw an analogy between the familiar architect's profession and the unfamiliar instructional design profession to help the novice learner conceptualize, organize and retain the major duties and functions of an instructional designer. Other cognitive strategies may include the use of framing, outlining, mnemonics, concept mapping, advance organizers and so forth.

5.5.7 Critical Questions (1) One: *What are the perceptions of the use of computer technology in teaching technical subject at "SS FET College"?*

According to the findings of this study, 40% of educators have negative perceptions towards the use of computer technology in teaching technical subjects. In the literature, review shows that if the perception is negative, educators cannot use the computer technology.

5.5.8 Critical Questions (2) Two: *How do the educators use computer technology in teaching technical subjects at “SS FET College”?*

The researcher found that 30% of educators were negative towards the using of computer technology as a tool for enhancing learning in teaching technical subjects. If you look at percentage, it is very small, but can cause a bad impact on the learners and their future.

40% of educators are not sure of what computer technology can do for them and they use it incorrectly. This can causes a negative perception towards the use of computer technology.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Being a member of staff at the FET College allowed the researcher easy access to educators. If this particular study was conducted in any other institution, then it would have been inconvenient for the researcher to set up interviews with educators and it would also have been inconvenient to travel a distance to meet the subject educators. In the case of this study, interviews were conducted on the FET College premises, and in their own suitable time.

Research methods such as observation and document analysis were beyond the scope of the present study. It would have been of interest to observe at first hand the practice and teaching methodologies that exist within the classrooms of all computer technology educators. It would have also been of interest to examine learner's computer rooms and textbooks to see if these books are anxiety provoking in any way.

The analysis of previous research and theories about perception and behaviour has shown that a range of factors can contribute to educators' perception to use ICT. These include their attitudes to information and communication technology (ICT), their beliefs in the value of ICT for teaching and learning and their perceptions of whether or not they can use it, and if it is effective in their teaching. Perception factors include making lessons

more interesting and more fun, contributing to pupils' learning, improving the presentation of materials and making the lessons more diverse.

The researcher has analysed the relationship between the extent of computer technology use and perception of educators towards the use of computer technology in teaching technical subjects. This has shown that the most significant perception factors relating to use were: perceived ability to use computer technology; difficulties experienced in using computer technology; level of resources available and their satisfaction with computer technology; and whether using computer technology in teaching is considered to be interesting and enjoyable. In referring to the cognitivist theory of planned behaviour, the researcher can deduce that the negative factors amongst these have not been sufficient to deter the educators in the researchers sample from using ICT. But the significant correlations imply that the more interesting and enjoyable using ICT is, and the greater their perceived abilities are and the fewer the difficulties experienced, then the more likely educators are to use it regularly in their teaching

6.2 Recommendations

6.2.1 Recommendations for educators

Educators are in need of on-going computer staff development programs and regular training especially to identify and remediate computer anxiety. In this study, the three educators of computer technology have not ever received any support from their FET College (in the form of on-going professional development). If we look outside, the world of computer technology grows day by day and they are still using the old technology, which is no longer used.

The researcher recommended that educators should strive for two goals when integrating technology. The first goal is to become a computer literacy educator. It may include producing materials to use in the classroom such as handouts, banners or newsletters. It may be using the computer to manage your students' marks or using a software program to strengthen a particular skill. The second goal is to make the computer a teaching partner rather than an object of study. "The instructional goals of computer-using educators are in art, science, math, language arts, social studies, or other disciplines, not in computers." (Geisert & Futrell, 1995)

The researcher found that computer technology educators like other professionals must engage in life-long program of professional development. The researcher believes that as professionals who must keep up with a rapidly changing and technically complex field,

computer technology educators especially need this and an opportunity to read, reflect, plan, and to exchange ideas with other computer technology educators.

Educators of computer technology can learn with and from other educators of computers. In fact, Bradley (1994) has something in mind, to have days set aside for professional development within FET Colleges and links with colleagues in other FET Colleges. This will assist in promoting pleasant classroom environments in which computer technology anxiety may be reduced.

The researcher recommends the changes in pre-service and in-service educators' perceptions towards computer technology; Yildirim (2000) found that educators' perceptions (anxiety, confidence, and liking) significantly improved after the computer literacy course. Yuen and Ma (2002) found that the two independent variables, perceived usefulness and perceived ease of use, directly affect the intention to computer use as stated in the Technology Acceptance Model (TAM). Furthermore, significant gender differences in computer acceptance were also found.

6.2.2 Recommendations to the managers

The researcher recommends that FET Colleges could not invest in technologies alone. They must also invest in ongoing professional development, training, and support services. Research-based agencies that focus on learning and collaboration often support successful technology programs. As technology vendors seek long-term relationships

with schools, they too will need to develop expertise in learning and will have to be able to provide professional development using their specific technologies and programs.

Managers should be able to support their educators with the resources that are needed to enhance learning and increase the life long learning of the learners. Give the educators a chance to attend upgrading courses. All the equipment should be repaired immediately after they have broken down

A knowledgeable technician that is trained to repair computers and deal with networking issues best provides technical support. A skilled educator can also provide technical support but appropriate release time to deal with this added responsibility is necessary. Classroom educators should be educated on basic troubleshooting measures but should also understand that they are not expected to be technicians. Administrators must also seek ways to provide curricular support to educators.

A technology co-ordinator hired by the FET Colleges division is often an ideal person for providing curriculum support in the area of technology. The technology coordinator can provide professional development plus mentor educators in their classrooms. Administrators should also ensure that a professional development fund is in place to encourage educators to take advantage of conferences and workshops that focus on integrating technology into the curriculum

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DOCUMENT ANALYSIS

- The syllabus for the computer related subjects (Duration of syllabus: date of issue of syllabus). Information system composed by the following subjects:

Information system:

Computer Practices, International Computer Driving License (ICDL) & Computer Literacy

	Educator	Campus	Syllabus	Date of issue	Gender	Comments
Computer Practices						
ICDL						
Computer Literacy						

- Scheme of work for Computer syllabus at A, B & C
- Educators timetable (Class timetable with the number of hours per day or week)
- Records for number of computers in the classroom
- Records for computer services & maintenance
- Classroom arrangement or classroom planning
- Records of computer application software programmers that are used
- Daily records for the learner’s attendance register
- Educator’s resources for presenting the lessons (such as printer floppy disks and hardware

Techniques for collecting data through observation

The researcher used the following methods of observation for collecting the data for this study.

Written descriptions:

The researcher can record observations of people, a situation or an environment by making notes of what has been observed.

Photographs and artefacts:

Photographs are a good way of collecting observable data of phenomena, which can be captured in a single shot, or series of shots. For example, photographs of computer technology buildings, neighbourhoods, dress and appearance. Artefacts are objects, which inform us about the phenomenon under study because of their significance to the phenomena. For example, as a computer technology lab. Similarly, they may be instruments or tools used by members of a sub group whether this is a population sub group or a professional.

Documentation:

A wide range of written materials can produce qualitative information. They can be particularly useful in trying to understand the philosophy of an organisation as may be required in action research and case studies. They can include policy documents, mission statements, vision and values, annual reports, minutes or meetings, codes of conduct, etc. Notice boards can be a valuable source of data. Researchers who use this method of data collection sometimes develop reputations as a “lurker” because of their tendency to lurk around notice boards! More information about observation can be found in the Trent Focus Resource Pack How to use observation in a research project.

OBSERVATION

- Classroom environment
- Computer conditions
- Presentation
- Learner's response
- Written descriptions:
- Photographs and artefacts:
- Documentation:

PROTOCOL FOR SEMI-STRUCTURED INTERVIEWS

The intention of the following interview questions was to gather information in the form of stories, anecdotes and narratives beyond the answers of the questions. Because of the semi-structured nature of these interviews, the wording changed based on the completeness and nature of the participant's response. Using perception as a value indicator in the interview process within the boundaries of the study, researcher attempted to follow the perception of the individual being interviewed as an active listener, injecting questions such as "What was that like?", "How did you feel about that?" and "Could you give me an example?" as appropriate to the interview response. In addition, where appropriate, I related the written work of an educator perception to the questions being posed. In some instances educators' perception became so enthusiastic in their response that all questions were not addressed directly.

Interview questions:

Related Background

- a. Could you tell me about your first connections with Computer Technology (CT) and how that interest grew?
- b. How long have you been working in the CT field?

Relevant questions used to develop a common language between the participant and the interviewer

- a. How do you define technology?
- b. How do you define Computer Technology?
- c. If Computer Technology is considered a management initiative such as Total Quality Management and Business Process Reengineering, how is it different?
- d. Where is CT in its life cycle?
- e. What do you understand about the term perception?

Questions geared at investigation educator perception passion in relation to CT

- a. Could you tell me about a time that you felt really passionate about CT?
- b. What is your perception about using of computer technology in technical education?

- c. What about CT excites your perception? How has this perception impacted your work in CT.?
- d. How has your perception around CT changed and developed over the years?
- e. [When appropriate] In your work, you have written a great deal about __CT____ [specific to thought educator being interviewed]. How does this area relate to ____CT____ [what we have been discussing].
- f. What areas of thought other than Computer Technology do you find exciting or have passion about?
- g. Would you share a personal value or belief? How does that value or belief extrapolate over to the field of Computer Technology? (Repeated several times if responder indicated interest.)

Thought Educators patterns

- a. What is your source of inspiration for creating new ideas in CT?
- b. Are there others who assist you in developing new ideas?
- c. Describe some of the new ideas you have contributed to the field of Computer Technology?
How do you feel about these ideas? How have these ideas been received?

educators perception on educators perception

- a. Do you see yourself as an educator perception?
- b. How has being a CT educator perception [or “professional” for pilot interview depending on response to (a) above] affected you?
- c. What rewards have come to you from your work in Computer Technology?
- d. Who motivate you about computer technology?
- e. [Where appropriate] in _____ [specific reference to educator’s perception published work] you said you were motivated by _____ [specific reference to thought educator’s work]. Is there anything you would add to that?
- f. In your opinion, who are the CT educator’s perceptions? Why do you consider them CT perception educators? What do you believe contributes to their education?
- g. In what ways has your thinking been influenced by other educators perception?
- h. How do you think your ideas have influenced other educator’s perception?

Closing perception on CT

- a. Does CT have a shadow (negative) side? If so, what is it?
- b. What future opportunity does Computer Technology offer individuals perception and organizations perception?
- c. How has your work in CT changed you? Changed organizations? Changed the world?

INTERVIEW QUESTIONS:**1 Related Background (Experience)**

- a. Could you tell me about your first connections with Computer Technology (CT) and how that interest grew?
- b. How long have you been working in the CT field?

2 Relevant questions used to develop a common language between the participant and the interviewer (Understanding)

- a. How do you define technology?
- b. How do you define Computer Technology?
- c. What do you understand about the term perception?

3 Questions geared at investigation educator knowledge and passion in relation to CT

- a. Could you tell me about a time that you felt really passionate about CT?
- b. What is your perception about using of computer technology in technical education?
- c. What about CT excites your perception? How has this perception impacted your work in CT.?
- d. How has your perception around CT changed and developed over the years?
- e. [When appropriate] In your work, you have written a great deal about __CT____ [specific to thought educator being interviewed]. How does this area relate to ____CT____ [what we have been discussing].
- f. What areas of thought other than Computer Technology do you find exciting or have passion about?
- g. Would you share a personal value or belief? How does that value or belief extrapolate over to the field of Computer Technology? (Repeated several times if responder indicated interest.)

4 Skills and values of education

- a. What is your source of inspiration for creating new ideas in CT?
- b. Are there others who assist you in developing new ideas?
- c. Describe some of the new ideas you have contributed to the field of Computer Technology?

How do you feel about these ideas? How have these ideas been received?

5 Educator's motivation on other educators'

- a. What rewards have come to you from your work in Computer Technology?
- b. Who motivate you about computer technology?
- c. e. [Where appropriate] in _____ [specific reference to educator's perception published work] you said you were motivated by _____ [specific reference to thought educator's work]. Is there anything you would add to that?
- d. f. In your opinion, who are the CT educator's motivators? Why do you consider them CT perception educators? What do you believe contributes to their education?
- e. In what ways has your thinking been influenced by other educators motivation?
- f. How do you think your ideas have influenced other educator's motivation?

6 Closing perception on CT

- a. Does CT have a shadow (negative) side? If so, what is it?
- b. What future opportunity does Computer Technology offer individuals perception and organizations perception?
- c. How has your work in CT changed you? Changed organizations? Changed the world?

PROCEDURES OF ORGANIZING INTERVIEWS

The researcher will write a letter to the rector, which asks the permission to conduct this study in the institution and make an appointment with him so that the researcher can explain the purpose of the study. He will also write the other letter to be signed by the rector, who will be submitted to the relevant campus managers by the researcher. With a permit from the rector the researcher will deliver to the campus managers.

From the campus managers, the researcher will ask them to give him time or set a date with manager, which the researcher can use to address the staff about the purpose of the study and its confidentiality.

With the random sampling, the researcher will set the dates with the participants in the study. Tell them about the interviews and participant observations, which will be, occur during the process of the study.

The letter of confidentiality will also be submitted to the participants so that after finishing with the interviews, they can sign and also the researcher.

Procedures of planning interviews

1. The researcher will carefully plan the interview, even though it is to be only semi-structured. Write down the topics and questions he might conceivably want to ask and consider various ways of arranging them.
2. The researcher first interview with the interviewee, he provides an overview of his purpose, intended uses for the interview data, and the measures you've taken to protect confidentiality and anonymity. Also, discuss and get permission for tape recording or note taking.
3. The researcher first interview with the person, ask a few background questions first, such as the interviewee's job title and responsibilities, time with the organization, etc. These often provide necessary information and serve to "warm up" the interviewee; that is, they are easy to answer and allow the interviewee to get in the interviewing mindset.

4. Focus on developing rapport and establishing a relaxed, comfortable climate. Be aware of your nonverbal communication: e.g., smiles, seating position, open/closed body posture, eye contact. In general, be yourself (authentic), positive about the interview, and confident.
5. The questions that focus on the topic(s) of interest should be broad, open-ended questions that allow the interviewee latitude in constructing an answer. Usually, qualitative researchers want to understand the interviewee's language and meanings, and open-ended questions encourage this. For example, if the focus of the interview is an event or episode such as a computer technology meeting, you could ask a question such as "Tell me the story of this meeting, beginning when you first heard of it." Often such a question, followed by probes, may lead to a 30-40 minute response.
6. Researcher prepares, and saves until later in the interview, questions on specific facts or other items of interest.
7. Because the interview follows up on observation, researcher may want to ask about specific messages or exchanges. Again, try not to be leading in your questioning. For example, ask "What did you mean when you said...." rather than "When you said...did you mean....?"
8. Use probes carefully to get more in-depth answers or to follow up on points of interest. Many interviewees talk in generalities, so use probes such as "Can you give me an example of that?" or "What did he say?" If the focus is communication, try to elicit the language and specific meanings involved.
9. Sometimes silence is the best probe. Being silent once interviewees pause that can encourage them to continue. Also, you may want to avoid interrupting a good story and instead make a note to probe a particular point later in the interview.
10. Think carefully about how to end the interview. It's often a good idea to ask "Is there anything else you'd like to tell me?" near the end. This can be especially powerful if done once the tape recorder is turned off. It's also often a good idea to ask if you can contact the interviewee later in case you have additional questions.
11. Immediately after the interview, take time to test your recorder to see if you recorded the whole interview, fill in the gaps in your notes, and write down your impressions.

LETTER SOLICITING PARTICIPANTS

Dear Mrs. Mary Smith

As a educator in the field of Computer Technology (CT), you are invited to participate in a research study that is being conducted to better understand the ideas in the field of CT that are helping more and more people and organizations take advantage of this new field, and those ideas that can make a difference in the way individuals, groups and organizations work. Sibuko Cele, in support of his Master in Education dissertation, is conducting this research.

You have been selected for this study because of your demonstrated contributions as an educator. Your experience and expertise in this area of study as proven by your continuous activity in CT or a closely related field over a period of several years, including publication of multiple books and articles and participation at a dozen or more symposia and conferences.

Participation in the study involves a two to three hour tape-recorded interview (in person and arranged at your convenience), concerning the core CT ideas you and other educators perception have generated, and how you feel about those ideas. Using “passion” as a value indicator, the study seeks to explore those ideas that you feel strongly about, and to look for patterns among those ideas and across all of the interviewed educator’s perception. The study will also consider the ways in which educator’s perception influences each other.

Researcher will be personally transcribing the interview, and sending a copy of the transcript back to you for your review, and modification if necessary, before analyzing the interview results. Interview results will be held strictly confidential unless you specifically request that researcher include your name as a participant in the study, and/or you specifically elect to have your name used with the specific responses you provide.

Aggregated results will be provided to each participant. By participating in this study, you may gain a greater understanding of the relationship of those ideas, which you are passionate about to the ideas of other though educators, have the opportunity to perceive CT in a new light, and potentially participate in building a new approach to CT.

The results of this research will be published in my dissertation and possibly in subsequent journals or books.

While you will have my deep appreciation for supporting my master's work, there is no remuneration for participating in this study.

Researcher looks forward to your response. For further information on this study, please contact [Contact information for master student and committee chair].

PARTICIPATION LETTER FORWARDING INFORMED CONSENT

Dear Mrs. Mary Smith

Thank you for agreeing to participate in the research study exploring. “To investigate how educators use of computer technology to teaching technical subjects at FET College” being conducted by Sibuko Cele. As an educator in the field of Computer Technology (CT), your participation will add significant value to the study.

The [pilot] study involves a one-hour tape-recorded interview, in person and arranged at your convenience, concerning the core CT ideas you and other thought educators have generated, and how you feel about those ideas. Using “perception” as a value indicator, the study seeks to explore those ideas that you feel strongly about, and look for patterns among those ideas and across all of the interviewed thought educators. The [pilot] study will also consider the ways in which thought educator’s perception influences each other.

Researcher will be transcribing the interview, and sending a copy of the transcript back to you for your review, and modification if necessary, prior to analyzing the interview results. Interview results will be held strictly confidential (kept in a locked cabinet and destroyed after two years) unless you specifically request that researcher include your name as a participant in the study, and/or you specifically elect to have your name used with the specific responses you provide. The University of KwaZulu/Natal retains the right to access signed informed consent forms. Aggregated results will be provided to each participant. Enclosed is the Informed Consent form that must be completed and mailed and/or faxed or electronically signed and emailed to me before the interview. A stamped, self-addressed envelope is enclosed for your use.

You may withdraw from this [pilot] study at any time without negative consequences, either during or after the interview until you have reviewed the interview transcripts. If you withdraw, all of your data will be removed from the study and will be destroyed.

The results of this research will be published in my dissertation and possibly in subsequent journals or books.

You have my deep appreciation for supporting my Master work. For further information on this study, please contact [Contact information for Master student and committee chair].

GENERAL INFORMED CONSENT

Two copies of this informed consent letter have been provided. Please sign both, indicating that you have read, understood, and agreed to participate in this research under the terms described. Return one to the Researcher and keep the other for your files.

NAME OF PARTICIPANT (please print)

SIGNATURE OF PARTICIPANT

DATE: _____



RESEARCH OFFICE (GOVAN MBEKI CENTRE)
WESTVILLE CAMPUS
TELEPHONE NO.: 031 – 2603587
EMAIL: ximbap@ukzn.ac.za

10 APRIL 2006

MR. SS CELE (200302883)
EDUCATION

Dear Mr. Cele

ETHICAL CLEARANCE APPROVAL NUMBER : HSS/06098A

I wish to confirm that ethical clearance has been granted for the following project:

“To investigate the perception of educators towards the use of computer technology in teaching technical subjects at Coastal KZN FET College”

Yours faithfully


.....
MS. PHUMELELE XIMBA
RESEARCH OFFICE

PS: The following general condition is applicable to all projects that have been granted ethical clearance:

THE RELEVANT AUTHORITIES SHOULD BE CONTACTED IN ORDER TO OBTAIN THE NECESSARY APPROVAL SHOULD THE RESEARCH INVOLVE UTILIZATION OF SPACE AND/OR FACILITIES AT OTHER INSTITUTIONS/ORGANISATIONS. WHERE QUESTIONNAIRES ARE USED IN THE PROJECT, THE RESEARCHER SHOULD ENSURE THAT THE QUESTIONNAIRE INCLUDES A SECTION AT THE END WHICH SHOULD BE COMPLETED BY THE PARTICIPANT (PRIOR TO THE COMPLETION OF THE QUESTIONNAIRE) INDICATING THAT HE/SHE WAS INFORMED OF THE NATURE AND PURPOSE OF THE PROJECT AND THAT THE INFORMATION GIVEN WILL BE KEPT CONFIDENTIAL.

cc. Derek Buchler
→ cc. Supervisor (Khoza SB)