

**PROBLEMS ENCOUNTERED WITH THE TEACHING OF COMPUTER
APPLICATIONS TECHNOLOGY AND INFORMATION TECHNOLOGY AT
SENIOR SECONDARY SCHOOL LEVEL: A MANAGERIAL PERSPECTIVE**

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DECLARATION

I, Li Rijuan, (passport no.G20132583), hereby declare that the dissertation entitled:

PROBLEMS ENCOUNTERED WITH THE TEACHING OF COMPUTER APPLICATIONS TECHNOLOGY AND INFORMATION TECHNOLOGY AT SENIOR SECONDARY SCHOOL LEVEL: A MANAGERIAL PERSPECTIVE

- is my own independent work; and complies with the Code of Academic Integrity, as well as other relevant policies, procedures, rules and regulations of the Central University of Technology, Free State;
- that all the sources quoted have been acknowledged by means of references; and
- that this dissertation has not been submitted before to any institution by myself or any other person in fulfillment (or partial fulfillment) of the requirements for the attainment of any qualification.

Li Rijuan

ABSTRACT

The aim of the study was to determine the problems encountered by educators who teach Computer Applications Technology (CAT) and Information Technology (IT) in the FET band in the Bloemfontein area, Free State. The main contribution of the study lies in the identification of those problems. By knowing and understanding the problems, the Department of Education and the stakeholders will seek solutions to rectify the problems which will lead to the successful implementation of IT and CAT.

The assumptions of the study were that many educators lacked basic ICT skills and pedagogical training, and there were not enough computer stations for learners.

Both the qualitative and quantitative approaches were used in the study. The researcher used the survey research method and data was collected through the use of questionnaires and interviews. Simple random sampling was used to ensure that each member of the population in the study had an equal chance of being selected.

Descriptive and inferential statistics were used in analyzing the data from the questionnaires. In order to analyze the qualitative data from the interviews, the researcher described the sample populations, ordered and coded the data (data processing), and displayed summaries of data in such a way that interpretation became easy. This was done by preparing tables, diagrams and pie charts.

According to the results of the study, the problems that the educators encountered include a lack of sufficient didactical training for educators, learners don't have computers at home to practice on, a lack of financial

support to provide relevant facilities for schools, such as computer laboratories and learning materials in IT/CAT, educators spend too much time on paper work and do not have enough time for teaching, and IT/CAT teachers become 'do-it-all' teachers with regard to any work on the computer, such as fixing the computer, designing the school website.

Regarding the identified problems, recommendations were made, such as the Department of Education must review the curriculum of IT and CAT, sufficient subject related training and didactical training for IT and CAT educators should be provided by the Department of Education on a regular basis.

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LIST OF ACRONYMS

CAT	Computer Applications Technology
DoE	Department of Education
ERA	Education Reform Act
FET	Further Education and Training
HEI	Higher Education Institution
ICT	Information and Communication Technology
ISTE	International Society for Technology in Education
IT	Information Technology
NCS	National Curriculum Statement
NEPAD	New Partnership for Africa's Development
NGOs	Non-Government Organisations
NQF	National Qualifications Framework

CHAPTER 1

INTRODUCTION AND OVERVIEW OF THE STUDY

1.1 INTRODUCTION

Computers and their applications are used from primary school to university level in a fast changing world. The introduction of computers into the educational equation has produced strong responses and has had profound effects; computers can support and are supporting a range of teaching and learning styles (Littleton & Light, 1999: 11). Computers can play a variety of roles in school. They can be used to teach other subjects, such as mathematics and physics; to assist educators in preparing lectures; to provide opportunities for students to learn how to use technology; or to give students general-purpose tools to perform academic tasks more effectively (Grabe & Grabe, 1996: 12). The computer, with its applications, has obvious possibilities for making significant contributions to the educational process. According to the South African National Curriculum Statements for Grades 10-12, Computer Applications Technology (CAT) and Information Technology (IT) are two new subjects which were implemented in the Further Education and Training (FET) Band as from the beginning of 2006 (DoE, 2003).

1.2 SIGNIFICANCE OF THE STUDY

The main aim of this study was to determine the problems that specific senior secondary schools encounter in the teaching of Computer Applications Technology (CAT) and Information Technology (IT) in the Bloemfontein area, Free State. The study is significant, as understanding the problems will lead to appropriate steps that can be taken to improve the management of the current situation at FET level and to ensure that the National Curriculum can

be implemented more effectively.

1.3 STATEMENT OF THE PROBLEM

The research problem that this study endeavored to investigate concerned the difficulties that educators encountered with the teaching of IT and CAT at FET level. Because IT and CAT are two new subjects which were implemented as from the beginning of 2006, the researcher deemed that there were problems that the educators encountered. Therefore, there was a need to identify the problems in order to have a successful implementation of the curriculum in the two mentioned subjects.

1.4 RESEARCH QUESTION

Regarding the problem statement, the following research question was formulated:

What problems are encountered by educators who teach Computer Applications Technology and Information Technology in the FET band according to the National Curriculum Statement (NCS)?

1.5 THE RESEARCH OBJECTIVE

The objective of this study was to determine the problems encountered by educators who teach CAT and IT in the FET band according to the NCS (refer to Chapter 4).

1.6 ASSUMPTIONS

The following assumptions were made with respect to this study:

Many educators lack basic ICT skills, because they did not receive adequate computer training when they were studying or being trained. Training in the skills of how to use ICT equipment, and how to use ICTs to effectively manage students' learning, both during the lesson and in the preparation of lessons before-hand (pedagogical training) are also inadequate. Another obstacle is that there are not enough computer stations for learners. This situation prevents educators from effectively teaching CAT and IT.

1.7 DEFINITIONS OF TERMS

1.7.1 Problem

The word 'problem' has the following meanings:

- A question to be considered, solved, or answered
- A situation, matter, or person that presents perplexity or difficulty
- A misgiving, objection, or complaint

(<http://www.answers.com/problem&r=67>)

The first and the second meanings are used in the study.

1.7.2 Computer Applications Technology

Computer Applications Technology is the effective use of information and communication technologies in an end-user computer applications environment in different sectors of society (DoE, 2003: 27).

1.7.3 Information Technology

Information Technology focuses on activities that deal with the solution of problems through logical thinking, information management and

communication. It also focuses on the development of computer applications using current development tools. The subject develops awareness and an understanding of the social, economic and other implications of using computers (DoE, 2003: 41).

1.7.4 Further Education and Training (FET) Band

The FET band consists of all learning and training programmes on NQF Levels 2 to 4, or the equivalent of Grades 10 to 12 in the school system. It is the band within the NQF which follows directly on the General Education and Training band and precedes Higher Education. Learners enter the FET band after the completion of the compulsory phase of education at Grade 9 or Level 1 on the NQF. FET is not compulsory education. By definition, it has no age limit. Its goal is to promote lifelong learning and education on-the-job. (http://www.polity.org.za/html/govdocs/green_papers/furtheredgp1.html)

1.7.5 Managerial Perspective

The word 'perspective' has the following meanings:

- The technique of representing three-dimensional objects and depth relationships on a two-dimensional surface
- A mental view or outlook

The second meaning is used in the study, which only focuses on the teaching situation. The researcher endeavors to find solutions to the problems encountered by educators, who teach CAT and IT, in order to improve the management of the current teaching and learning situation.

1.7.6 E-school

E-School provides a "world class education for all learners." School is any place, anytime and for everyone. This new concept of schooling that is accessed over the Internet offers creative and unique opportunities to change the face of public education for students and teachers by incorporating new instructional strategies for disseminating information and promoting interactive environments to enhance learning (<http://atr.k12.hi.us/eschool/index.shtml>).

1.8 THEORETICAL FRAMEWORK

Computers have become almost indispensable over the last quarter of the twentieth century, and one certainty is that computers will play an increasingly significant role in both our leisure environments and our working lives. According to Littleton and Light (1999: 1), learning to live and work with computers must figure among the more obvious outcomes of any contemporary educational curriculum. Today's children need to become aware of the potential of new technologies in all aspects of their lives.

Computer Applications Technology (CAT) is the effective use of information and communication technologies in an end-user computer applications environment in different sectors of society (DoE, 2003: 27). The content of the subject can equip learners with knowledge, skills, values and attitudes to create, design and communicate information in different formats. This subject further makes it possible for learners to collect, analyze and edit data and to manipulate, process, present and communicate information to different sectors of society. Information Technology (IT) focuses on activities that deal with the solution of problems through logical thinking, information management and communication. IT focuses on the development of computer applications.

This subject will enable learners to understand the principles of computing through the use of a current programming language, hardware and software, and how these apply to their daily lives, to the world of work and to their communities (DoE, 2003: 41). By using computers in school and in teaching and learning, learners will be equipped with knowledge and skills to be competent and confident in accessing and working with various forms of information and data.

Although the capabilities of the computer offer exciting possibilities for educators to expand and enhance the curriculum, there are still some problems that may keep educators from utilizing the full potential of the computer to teach. Mentz and Mentz (2002: 9), identify a few obstacles that prevent the effective use of computers in schools in South Africa: insufficient financial support by the Department of Education, untrained educators, the socio-economic status of the community and a lack of classrooms suitable to serve as computer laboratories. According to Watson and Tinsley (1995: 153), the implementation of a large computer project is never easy. Most of the problems are associated with ineffective in-service courses, movement of educators, scarcity of resources and hardware.

Thinking about the future is important for educators. Preparing learners for the future requires some consideration of the skills that learners will need to work in the future and the rapidly evolving role of technology in educational practice. In order to teach CAT and IT successfully at secondary school level, educators and schools should have awareness and knowledge of and a positive attitude towards the two subjects and the curriculum changes that have taken place. Solutions need to be found to solve the existing problems that these subjects bring about so that the new curriculum can be implemented more effectively.

1.9 METHODOLOGY

1.9.1 Research Approach

Qualitative research is a form of inquiry that explores phenomena in their natural settings and uses multi-methods to interpret, understand, explain and bring meaning to the phenomena (Anderson & Arsenault, 1998: 119).

Quantitative research employs operational definitions to generate numerical data to answer a set of questions pertaining to the study (Ary, Jacobs & Razavieh, 2002: 565).

The approach to this study contains both qualitative and quantitative characteristics as a qualitative interpretation of a quantitative summary of the data that was obtained, was made. Qualitative research describes and analyses people's individual and collective social actions, beliefs, thoughts and perceptions (Litheko, 2005: 18 of 349). It is a naturalistic inquiry, using non-interfering data collection strategies to discover the natural flow of events and processes and how participants interpret them. In this approach, the researcher collects data by interacting with selected persons in their setting (field research) and by reading relevant documents. A quantitative approach seeks to determine the relationships among variables. It is based on the argument that both the natural and social sciences strive for testable and confirmable theories that explain phenomena by showing how they are derived from theoretical assumptions (Ary *et al.*, 2002: 422).

1.9.2 The Research Method

A survey describes the method of obtaining information from a sample of

individuals from a specific population. The individuals are asked questions, according to standardized procedures, with the intent of obtaining a composite profile of the population with regard to particular aspects (Van der Merwe, 2005: 13). Surveys implement questionnaires and interviews to gather information from groups of subjects. Surveys permit the researcher to summarize the characteristics of different groups or to measure their attitudes and opinions towards some issue (Ary, Jacobs & Razavieh, 2002: 25).

1.9.3 Population

According to Lategan and Lues (2005: 117), a population is the universe or totality about which inference is made and conclusions are drawn. The population of this research consists of secondary schools in the Mangaung district (Bloemfontein, Thaba Nchu and Botshabelo) of the Free State Province, South Africa, at which CAT and/or IT are presented as electives within the FET band.

1.9.4 Sample and Sampling

A sample is a selection of a population. Observations are made based on the elements of the sample (Lategan & Lues, 2005: 117). The purpose of sampling is to enable the researcher to obtain the required information in a reliable way, without involving the entire population. The sample in this study was CAT and IT educators from fifteen secondary schools in the Mangaung district of the Free State Province. Simple random sampling was used to ensure that each member of the population in the study had an equal chance of being selected.

1.9.5 Instrumentation

The instruments used in this study to gather the data were questionnaires and interviews. Instrumentation can be a threat to internal validity, and is related to testing. Instrumentation refers to the way in which changes in the instruments or persons used to collect the data might affect the results (McMillan & Schumacher, 2001: 189).

1.9.5.1 Interviews

An interview is defined as a specialized form of communication between people for a specific purpose associated with some agreed subject matter (Anderson *et al.* 1998: 190). Through an interview, the researcher may stimulate the subject to greater insight into his or her own experiences. Interviews are good opportunities to impress the importance of confidentiality on respondents. The unstructured interview was used as it allowed the researcher greater scope in asking questions in her own way. The researcher however, had a framework of questions in mind. Twenty educators were interviewed in this study.

1.9.5.2 Questionnaires

A questionnaire is a structured set of open-ended or closed questions, eliciting quantitative or qualitative information on one theme or topic and lending itself to data capture and analysis (Lategan & Lues, 2005: 117). A questionnaire is relatively economical, has the same questions for all subjects, can ensure anonymity, and contains questions written for specific purposes. In this study, twenty CAT and IT educators teaching in the FET band were asked to complete the questionnaire.

1.10 DATA ANALYSIS

Descriptive statistics is a technique for organizing, summarizing and describing observations (Ary *et al.*, 2002: 558, 561). Analyzing inferential statistics is a procedure that allows the researcher to make generalizations from sampled data to the population from which the sample was drawn (Ary *et al.*, 2002: 558, 561). Descriptive and inferential statistics were used in analyzing the data from the questionnaire as it allowed the researcher to use numerical techniques to summarize the data (Burns, 2000: 43). Cross tabulations, figures and charts are essential for organizing and summarizing the whole set of data of this study because they permit comparisons across groups (Ary *et al.*, 2002: 411). The gathered information from respondents was organized and analyzed by the researcher. In order to analyze the qualitative data from the interviews, the researcher described the sample populations, ordered and coded the data (data processing), and displayed summaries of data in such a way that interpretation became easy. This was done by preparing tables, diagrams and pie charts. Conclusions were then drawn and related to other data sets in the study.

1.11 VALIDITY AND RELIABILITY

Validity is a judgment of the appropriateness of a measure for specific inferences or decisions that result from the scores generated (Litheko, 2005: 52 of 349). In other words, validity is a situation-specific concept: validity is assessed depending on the purpose, population, and environmental characteristics in which measurement takes place (Litheko, 2005: 52 of 349). Validity is an important key to effective research. If a piece of research is invalid, it is worthless. In order to maximize the validity, the researcher chose an appropriate time scale, selected an appropriate methodology for answering the research questions, and selected appropriate instrumentation for gathering

the type of data that is required.

Reliability is essentially a synonym for consistency and replicability over time, over instruments and over groups of respondents. It is concerned with precision and accuracy (Litheko, 2005: 224 of 349). To maximize reliability, the researcher used procedures and measures which lead to consistent results (refer to Chapter 4). In order to test for reliability, the researcher chose two secondary schools to distribute the questionnaire to and at which the educators were interviewed. After obtaining reliable results, the researcher continued the research at the other schools. The questionnaires and interviews were appropriate instrumentations for ensuring reliability. The final results were carefully presented in a fair and unbiased way.

1.12 LIMITATIONS OF THE STUDY

20 secondary schools in the Mangaung district of the Free State Province supplied data for this study. The results of this study were not generalized to institutions like colleges of education, technical colleges and universities as they educate a different type of learner, and employ different types of educators. It is also can not be generalized to other schools (secondary) in South Africa.

1.13 DIVISION OF CHAPTERS

Chapter 1: Introduction and overview of the study

Chapter 2: Literature review

Chapter 3: Research methodology

Chapter 4: Problems encountered with the teaching of Information
Technology and Computer Applications Technology

Chapter 5: Summary, Conclusions and Recommendations

1.14 SUMMARY

In this chapter, the researcher highlighted the significance of the study. The research problem was stated as well as the research question, research objective and research assumptions. Some key terms were defined. The research methodology, data analysis, validity and reliability were discussed. The researcher also explained the limitations of the study.

Chapter 2 will be the literature review.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The explosion of advanced information and communication technologies (ICTs) changed our lives in many ways. These advanced technologies offer us the convenience and efficiency of instantaneous, world-wide communication and the capacity to store and process increasingly complex volumes of information and data. Technology has created dramatic changes in the way people communicate, learn, do business and solve problems (Tsopo, 2005: 2). According to the White Paper on e-Education (DoE, 2004: 8), the expansion of ICTs is driving significant changes in many aspects of human endeavor throughout the world. ICTs are found in all sectors of the workplace in developed countries and it is becoming increasingly used in the developing world (Selinger, 2000: 7). The use of ICTs is seen as a means to help developing countries become global players. To withhold the introduction of technologies is possibly to marginalize developing countries even further (Kajee, 2005: 40). The role of ICTs in supporting and advancing all types of development in South Africa has been proclaimed from many platforms and cannot be disputed. ICTs can, and will, continue to play an important role in helping to solve many problems in South Africa, such as to lessen poverty (Solms, 2005: 1 of 1).

We are living in a society in which many believe in the virtues of ICT: "Information technology in education is an incredible resource and will, without question, continue to be the single most important component of 21st century education" (Trattner, Wang and Carter, 2000: 34). According to Grace and Kenny (2003: 3 of 13), educational systems that ignore ICTs might fail to

produce a technically literate population and hinder a country's ability to compete in the global economy. Access to ICTs from the earliest educational levels will ensure that populations are able to adapt to new technologies and remain competitive.

The ICT revolution has had an impact on curriculum development and delivery and continues to pose new challenges for education and training systems. South Africa's quest to build an education system suitable to meet the needs of the 21st century cannot be realized without the use of information and communication technologies (ICTs). Our world is changing, and ICT is central to this change. According to Littleton and Light (1999: 1), learning to live and work with computers must figure among the more obvious outcomes of any contemporary educational curriculum.

Tsopo (2005: 4) states that the introduction of ICTs into the learning process will fundamentally change the role of educators and the way schools are run and administered. Educators will increasingly fulfill the role of guiding learners in self-learning, data sourcing and analysis and other computer-based learning projects.

The main benefit that ICTs bring to education, according to recent research findings such as by Addo (2003: 3), is that communication channels are increased through e-mail, discussion groups and chat rooms. Regular use of ICTs across different Further Education and Training curriculum subjects can have a beneficial motivational influence on students' learning and promote greater efficiency throughout the school (Software and Information Industry Association (SIIA) Report, USA, 2000: 1 of 1). There are many benefits for educators to use ICTs: ICTs facilitate the sharing of resources, expertise and advice, promote greater flexibility in when and where tasks are carried out and lead to gains in ICT literacy skills, confidence and enthusiasm. It contributes

to easier planning and preparation of lessons and designing materials, help to access up-to-date learner and school data at any time and place, it enhances a professional image projected to colleagues, and computer-use during lessons motivates students to continue learning after school hours (Software and Information Industry Association (SIIA) Report, USA, 2000: 1 of 1). There are many other benefits for learners, such as the encouragement of independent and active learning, taking self-responsibility for learning, and the development of higher-level learning styles. Students who use educational technology at school feel more successful, are more motivated to learn and have increased self-confidence and self-esteem. Having more opportunities to collaborate on assignments with people outside or inside school is a further benefit (Software and Information Industry Association (SIIA) Report, USA, 2000: 1 of 1).

2.2 WHAT IS COMPUTER APPLICATIONS TECHNOLOGY (CAT) AND INFORMATION TECHNOLOGY (IT)?

Even though many basic and professional ICT skills are acquired through informal means either at work or at home, formal education plays an important role in the learning process. Formal training is especially important to a large portion of the South African population who do not have home access to computers or who are employed in jobs which do not bring them into contact with computers on a regular basis. Like in most parts of the world, the South African education and training system has to respond to the challenges posed by the information revolution. Its target is to transform all schools countrywide into e-Schools by 2013, and to make all learners in the Further Education and Training Band computer literate by this date (Tsope, 2005: 5).

According to the South African National Curriculum Statement for Grades 10-12, Computer Applications Technology (CAT) and Information Technology (IT) are two new subjects which were implemented in the Further Education

and Training (FET) Band, as from the beginning of 2006 (DoE, 2003). The Further Education and Training (FET) Band has an enormous potential to contribute towards skills development, employment and the economic development of our country. To this respect the approval of a new curriculum for senior secondary schools has been a major achievement. The new curriculum will produce students who are creative, reflective, lifelong learners, ready either to pursue their learning careers in higher education or to enter the labor market. According to the Department of Education (2003:27 and 41):

“Computer Applications Technology (CAT) is the effective use of information and communication technologies in an end-user computer applications environment in different sectors of society. The content of the subject can equip learners with knowledge, skills, values and attitudes to create, design and communicate information in different formats. This subject further makes it possible for learners to collect, analyze and edit data and to manipulate, process, present and communicate information to different sectors of society. Information Technology (IT) focuses on activities that deal with the solution of problems through logical thinking, information management and communication. IT focuses on the development of computer applications. This subject will enable learners to understand the principles of computing through the use of a current programming language, hardware and software, and how these apply to their daily lives, to the world of work and to their communities.”

The Conference of Commonwealth Education Ministers, representing a large number of developing countries, agreed that the process of integrating information technology into education should be speeded up (CCEM, 2000: 31). By using computers in teaching and learning in schools, learners will be equipped with knowledge and skills to be competent and confident in accessing and working with various forms of information and data.

2.3 THE TEACHING OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTS) THROUGH THE SUBJECTS COMPUTER APPLICATION TECHNOLOGY AND INFORMATION TECHNOLOGY

The New Partnership for Africa's Development (NEPAD) identified ICTs as central in reducing poverty on this continent. ICTs provide hope for overcoming barriers of social and geographical isolation, increase access to information and education, and enable the poor to participate in the making of decisions that have an impact on their lives (DoE, 2004: 9).

The International Society for Technology in Education (ISTE, 2007: 1 of 1) identified five reasons for the teaching of computer applications and information technology at school level: Parents want their children to graduate with skills that prepare them to either get a job in today's marketplace or advance to higher levels of education and training. Employers want to hire employees who are honest, reliable, literate, and able to reason, communicate, make decisions, and learn. Communities want schools to prepare their children to become good citizens and productive members of society in an increasingly technological and information-based world. National leaders, the Department of Education, and other federal agencies recognize the essential role of technology in 21st century education. And most of all, kids need it.

Consider the potential of ICTs to change the nature of work and leisure over the next twenty years. Today's children, at the very least, need to become aware of the potential of new technologies in all aspects of their lives. They need to develop the skills which will enable them (and society as a whole) to benefit from new opportunities offered through ICTs. Learners who move through the education system without acquiring skills in applying computer

technology will be at a disadvantage when they compete for opportunities in an environment where it is taken for granted that a person knows how to use a computer. Our education system must therefore accept some responsibility to prepare learners for this reality. Schools are expected to equip learners with the basic computer technology skills required by society.

According to the Education Director-General Duncan Hindle, across the world, developed and developing countries have revised their curriculums in recent years, to take into account the knowledge and skills needed in a globalised 21st century (Gadebe, 2005: 1 of 2). In developing countries such as South Africa, more emphasis needs to be put on the training of learners as well as educators in computer technology. As no country will be left untouched by the information revolution, many are engaging in initiatives and formulating policies to maximise the country's potential to exploit the new technologies. South Africa is no different (Hodge & Miller, 1997: 2).

2.4 INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN EDUCATION IN SOUTH AFRICA

In 1998, a new approach to education was introduced in schools in South Africa, called Curriculum 2005. This new approach implemented the instructional method known as outcomes-based education. Eight learning areas in the FET band were introduced in schools, of which Technology was one.

In November 2001, the strategy for implementing Information and Communication Technology in Education was launched jointly by the Department of Education and the Department of Communications. The strategy articulates strong support for educational ICT, and the Ministerial ICT Task Team also intended to provide direction to the Minister of Education on the

implementation of ICTs in Education.

In 2003, the integration of ICTs into teaching and learning had risen on the South African educational agenda, particularly with the release of the White Paper on e-Education (DoE: 2004). According to the White Paper participation in the information society is a big challenge for South Africa. The Department of Education stipulates that participation in the information society means that “Every South African learner in the general and further education and training bands will be ICT capable (that is, use ICTs confidently and creatively to help develop the skills and knowledge they need to achieve personal goals and to be full participants in the global community) by 2013” (DoE, 2003: 17).

In July 2005, the South African Department of Education introduced a new curriculum for Grades 10, 11 and 12 to be implemented over a period of three years, beginning in 2006. The Education Director-General, Mr. Hindle D. said the introduction of a new curriculum with respect to computer education was not unique to South Africa, but was an international benchmark fostering the necessary knowledge and skills to participate in and contribute to a democratic society and economy (Gadebe, 2005: 1 of 2).

2.5 SOUTH AFRICAN COMPUTER TECHNOLOGY EDUCATION STATUS

As a developing country with its particular history, South Africa faces enormous socio-political problems and challenges. The lack of developed infrastructure for information and communication technologies is widening the gap between South Africa and the developed world (DoE, 2004: 9). If South Africa is to take up its rightful place in the world in the twenty-first century, it will have to ensure that it rapidly raises its computer skills profile.

In 1997, South Africa was the 14th most networks-connected country in the world, yet fewer than one percent of its schools had internet access (Mentz & Mentz, 2002: 7). In 1998, the Department of Education of South Africa reported that 82% of all schools in the country did not have any educational media at all. Therefore, a large number of learners in the country did not receive any training in basic computer technology (Mentz & Mentz, 2002: 7). Although the number of schools with computers for teaching and learning increased from 12.3% in 1999 to 26.5% in 2002, there are still more than 19,000 schools without computers for teaching and learning in South Africa (DoE, 2004: 12).

In both primary and secondary schools, the teaching of basic computer principles and word processing skills forms the most important component in the teaching of computer literacy. In 2003, the South Africa Intel Innovation in Education, Teach to the Future-programme was launched. This project aimed at integrating the use of computers in Curriculum 2005 and the Revised National Curriculum Statements so that learners could increase their learning achievement (Wilson-Strydom, Thomson & Hodgkinson-Williams, 2005: 75). By October 2005, a total of 848 schools, spread across all nine provinces, were taking part in the programme. However, the present level of computer integration into the curriculum is still not sufficient and must be improved in order to address the digital divide so that South Africa can become a global player.

2.6 PROBLEMS ENCOUNTERED BY EDUCATORS WITH TEACHING INFORMATION AND COMMUNICATION TECHNOLOGY IN GENERAL

Although the capabilities of ICTs offer exciting possibilities for educators to expand and enhance the curriculum, there are still some problems that may

keep educators from utilizing the full potential of the computer to teach learners.

According to Van Wyk (2006: 1 of 1), CAT prepares learners to use the computer as an application tool. There is no doubt that CAT is a necessary subject and that secondary schools should be encouraged to offer it. The problem with CAT, however, is that it consumes a huge amount of computer resources. Regular use of a computer laboratory is required to teach the subject. Large schools with multiple class groups per grade, at which CAT was introduced in 2006, found that the subject demands that most of the available scheduled periods be spent in the computer room. Furthermore, Van Wyk (2006: 1 of 1) states that ICT projects in schools have a high rate of failure, because too much emphasis is often placed on how the technical solution is to manifest itself, rather than what it is to be used for. There is no point in having a perfectly configured computer facility, which is locked up because the educators are unsure about how to use it.

Educators face a number of constraints that make the shift to a more computer technologically driven classroom difficult. These include time limitations, pressure to cover the curriculum, lack of funds to purchase or upgrade hardware and/or software, and limited numbers of internet connections (Oberg and Gibson, 1999: 239-252).

Attewell (2001: 256) comments on the pressures created by the high costs of computer equipment, as well as the “limited time for training ... on technology or for developing a curriculum tailored to computers. Finally, few schools can afford technicians to support educational computing.” What is more, Attewell notes, “much of the appeal of educational computing stems from the hope that children can learn at the computer with minimal intervention from adults...” Unfortunately, we discover that computers can easily provide unsupervised

entertainment, but to educate effectively with computing requires as much if not more adult support and effort as do traditional teaching methods.” (Attewell, 2001: 256)

A telephone survey was conducted by Mentz and Mentz (2002: 9), and involved 49 schools representing 26417 learners from the Potchefstroom district in the North West Province of South Africa. They identified a few obstacles that prevent the effective use of computers in schools in South Africa, such as insufficient financial support by the Department of Education; untrained educators; lack of electricity; socio-economic status of the community; unfavorable educator-learner ratios (usually more than 1:30) and lack of classrooms suitable to serve as computer laboratories.

In Howie, Muller and Paterson’s research (2005: 93), they identified a few obstacles that the educators experienced, such as lack of ICT-related knowledge among educators, insufficient time for educators to prepare lessons, problems in scheduling enough computer time for different classes, difficulty with using the internet by low-achieving students, no time in the school schedule for using the internet and no time in educators’ schedules to explore opportunities for using the internet, financial constraints (lack of funds, insufficient number of computers), and the absence of a properly-developed curriculum for teaching computer skills.

A report, which was carried out by the British Educational Communications and Technology Agency, brings together evidence from a range of sources on the actual and perceived barriers to the teaching of ICT by educators, as identified in a review of some of the available literature associated with educators’ use of ICT, and also by education practitioners who took part in a small scale survey. The findings of the research into the barriers to the uptake of ICT by educators are now presented (Jones, 2004: 7-16):

Educators lack confidence. They fear admitting to their students that they have little knowledge of ICTs and they feel anxious to use ICTs in front of their students, who may know more than they do.

Educators lack pedagogical training. It is very important that the educators must not only be trained in the skills of using ICT equipment, but also be trained in how to use ICTs to effectively manage students' learning, both during the lesson and also in the preparation of lessons before-hand (pedagogical training).

Due to the fact that many educators do not receive enough computer training when they are in college/university, they are unable to solve technical computer problems and don't understand the basic working of the computer. There is an urgent need for the training of educators in specific ICT skills, so that they will be able to make use of ICTs to teach learners the content and skills related to computers.

Many educators complained that a lack of computers and software limits what they can do in the classroom with regard to the teaching of CAT and IT.

As ICTs develop rapidly, hardware becomes obsolete very quickly. Many schools are not able to update their resources frequently enough. However, many students have updated equipment at home. This causes further difficulties for educators using older technologies at school.

There is a lack of personal access to computers for teaching. Educators suggested that they should have their own personal access to ICTs, which would allow them to prepare and plan lessons.

It was also found that a frequently mentioned problem was the lack of time

available for the educators to complete the given tasks. Some educators are afraid of things going wrong, such as when they need to connect the computer with the printer, they don't know/are not sure what to do. Therefore, a lack of technical support will lead them to avoid using the computer.

In Wilson-Strydom, Thomson and Hodgkinson-Williams' survey (2005: 79), they identified problems such as a lack of access to required software, too little preparation time, no internet connection, a lack of both administrative and technical support and the most commonly noted problem was that the necessary computers were not available.

According to Wozney, Venkatesh and Abrami (2006: 2), researchers have suggested numerous and disparate factors that may influence the degree to which educators implement and persist in the implementation of educational innovations in general. These include personal and demographic factors related to educators, the quality of professional development offered to educators, the extent to which administrative and curricular support is available to educators, as well as the quality of educator access to computer resources. The cost associated with the implementation would be a major barrier (e.g. maintenance by technical staff and time-consuming training).

From the above findings by other researchers, it is clear that there are many factors preventing educators from using computers effectively to teach learners in general. This research, however, will only focus on determining the problems that educators encounter with the teaching of CAT and IT.

2.7 HOW TO OVERCOME THE BARRIERS THAT EDUCATORS ENCOUNTER

Due to the fact that there are many problems educators encounter in their

teaching of ICTs, a lot of researchers propose solutions. Tearle (2004: 346) suggests that there must be a carefully planned process through which ICTs are implemented across the school. ICT resources as well as training and support must be provided. Educators should have a positive attitude to ICTs and believe in its use. It is furthermore important that educators have adequate ICT knowledge, understanding and skills.

Regarding the time obstacle, Dagada (2005: 116) suggests that the long –term solution would be to put computers in each classroom and provide educators with laptops, so that learners do not need to wait for weeks to go to the computer laboratory to have computer lessons. Educators can use their laptops anywhere and at any time, to prepare lessons.

Mentz and Mentz (2002: 12) said that in managing the process of introducing technology into schools, the training of educators should be adequate to empower educators in order to function as computer literate teachers in a society that demands the knowledge and skills associated with technology. Furthermore, the authors emphasized that any department of education had, as one of its duties, to ensure that educators are professionally trained and prepared to meet the challenges that teaching and learning pose. The school management should again create an environment conducive to the new culture brought about by exposing educators to technology. Networking among educators and co-operative learning whereby educators share their newly gained knowledge with each other is vital. A school's management department must make sure that available computers are used optimally and that the school timetable provides for the introduction of technology to learners.

In order to solve the financial problem, Mentz and Mentz (2002: 13) suggest that the school principal should be involved in forging partnerships between

the private sector and the school. Howie, Muller and Paterson (2005: 28) suggest that there must be partnerships and collaboration in providing, developing, and producing information and communication technology in education. A coordinated audit of resources in ICT at schools on a national basis and the development of a network of community centres should also be established.

2.8 EDUCATIONAL MANAGEMENT

Van der Westhuizen P.C. (2002: 55), describes that educational management is a specific type of work in education which comprises those regulatory tasks or actions executed by a person or body in a position of authority in a specific field or area of regulation, so as to allow formative education to take place. According to Van der Westhuizen P.C. (2002: 55), this definition of educational management implies that management is a specific kind of work in education which comprises a number of regulative tasks or actions and is brought into effect in a specific area of regulation. Authority is essential for good management. The aim of educational management is the realization of formative education in a unique way. Management is a human act, that people are involved and that it is therefore subject to norms. Management is an interwoven act and management takes place in relation to an organization. From the above description of educational management, it appears that management is not merely an intuitive act, but that it requires thorough training and research.

Bush T. (1995: 1) describes educational management as a field of study and practice concerned with the operation of educational organizations. According to West-Burnham (1994: 28), management is a verb, not a noun. Managing is doing things, making things happen, it is about the processes that all people engage in in the course of their lives in organizations.

2.9 WHY MANAGEMENT ?

The management of schools has changed significantly since the 1988 Education Reform Act (ERA) (Blandford, 1997: 2). All school management teams, be it nursery, primary, special or secondary schools, now have management responsibilities which hitherto were in the domain of the Local Education Authorities. Areas, such as budgeting, marketing and development, curriculum co-ordination, pastoral and academic guidance, staff development, appraisal and selection and strategic planning, have had a great impact on schools' management (Blandford, 1997: 2). The movement of management from the Local Education Authorities to the schools set new parameters for management practice in schools. As a direct consequence of the ERA new structures for management of schools evolved, which in turn led to new roles for existing school managers and the proliferation of management teams. Teachers are no longer only classroom managers responsible for the delivery of the curriculum, they are also managers with responsibilities as diverse as developing the new school prospectus and purchasing curtains. While it is essential to view teachers within the context of learning, the profession now requires teachers to develop new skills to accommodate the need to manage policies, resources and other people.

3. SUMMARY

Recent research highlights many problems that educators encounter when using ICTs in their teaching. Examples include a lack of sufficient training for educators, lack of facilities, lack of time, lack of technicians and so on. This research will focus specifically on the use of computers in the teaching of Computer Applications Technology (CAT) and Information Technology (IT) in the Further Education and Training Band, and not on the use of ICTs in the teaching of non-computer related subjects. In order to determine problems

related to the teaching of CAT and IT on FET level in South Africa, the researcher chose Bloemfontein and the surrounding area in the Free State Province to conduct her research. Knowledge of the problems will lead to actions that can be taken to address problem situations with respect to computer training in schools and in doing so to improve the management of the teaching-learning situation in senior secondary schools.

It can safely be assumed that providing young minds with a high-standard of education is one of the key factors to ensure that a country becomes competitive on many different levels. If the implementation and use of ICTs in schools is managed successfully, a developing country will reap the benefits by becoming an integral part of the global economy.

Educational management was defined and why management in education was addressed in this chapter.

Chapter three will discuss the methodology used in the study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter describes the research method that was chosen and used in the study. In discussing the methodology, emphasis is put on the research design, instrumentation and data collection procedures.

3.2 RESEARCH PROBLEM AND MOTIVATION FOR THE STUDY

According to the South African National Curriculum Statements for Grades 10-12, Computer Applications Technology (CAT) and Information Technology (IT) are two new subjects which were implemented in the Further Education and Training (FET) Band as from the beginning of 2006 (DoE, 2003). The research problem that this study endeavors to investigate, concerns problems/difficulties that educators encounter with the teaching of CAT and IT at FET level. Understanding the problems/difficulties will lead to appropriate steps that can be taken to improve the management of the current teaching situation of these two subjects at FET level and to ensure that the national curriculum can be implemented more effectively.

3.3 OBJECTIVE OF THE STUDY

The objective of this study is to determine the problems encountered by educators who teach CAT and IT in the FET band according to the NCS.

3.4 RESEARCH QUESTION

This research will answer the following question:

What problems are encountered by educators who teach Computer Applications Technology and Information Technology in the FET band according to the National Curriculum Statement (NCS)?

The above question will be addressed in Chapter 4 of the dissertation. The data for the research question was collected by using questionnaires and interviews. The population for the research question was secondary schools in the Mangaung area (Bloemfontein, Thaba Nchu and Botshabelo) of the Free State Province, which present IT and/or CAT. The sample consisted of educators teaching CAT and/or IT from fifteen secondary schools in the Mangaung area of the Free State.

3.5 RESEARCH STRATEGY AND TECHNIQUES

The approach to this study will contain both qualitative and quantitative characteristics as a qualitative interpretation of a quantitative summary of the data that was obtained, will be made.

3.5.1 Research Approach

Qualitative research is a form of inquiry that explores phenomena in their natural settings and uses multi-methods to interpret, understand, explain and bring meaning to the phenomena (Anderson & Arsenault, 1998: 119).

The literature review in Chapter 2 reflects a number of problems that educators encounter with the teaching of computer related concepts. These include

insufficient financial support by the Department of Education, a lack of ICT-related knowledge among educators, a lack of pedagogical training for educators, time limitations and many more. The flexibility of the qualitative approach allows the researcher to examine the problems that were encountered by educators who teach CAT and IT in the FET band according to the NCS. By using a qualitative approach, the researcher was able to describe and analyze people's individual and collective social actions, beliefs, thoughts and perceptions (Litheko, 2005: 18 of 349) with regard to the teaching of IT and CAT. A qualitative approach is a naturalistic inquiry, using non-interfering data collection strategies to discover the natural flow of events and processes and how participants interpret them (Litheko, 2005: 18 of 349).

Qualitative research emphasizes natural settings and is focused on the understanding of verbal narratives. The researcher collected data by interacting with selected persons in natural occurring situations. The participating educators answered the questionnaire and were interviewed by the researcher.

The reasons for combining qualitative and quantitative approaches have been explained in Chapter 1 Section 1.9. Quantitative research is an approach that employs operational definitions to generate numerical data to answer a set of questions pertaining to the study (Ary, Jacobs & Razavieh, 2002: 565). A quantitative approach allows the researcher to determine the relationships between variables. The researcher initially established the following assumptions: Many educators lack basic ICT skills because they did not receive adequate computer training when they were studying. Training in the skills of how to use ICT equipment, and how to use ICTs to effectively manage students' learning, both during the lesson and also in the preparation of lessons before-hand (pedagogical training) is also inadequate. Another obstacle is that there are not enough computer stations for the learners to

practice on. This situation prevents educators from effectively teaching CAT and IT. The assumptions were later tested using predetermined procedure, namely questionnaire and interviews (Ary, Jacobs & Razavieh, 2002: 422).

The combination approach incorporating the use of a questionnaire and interviews were used to gather data from the participants, in order to determine the participants' characteristics, experiences and most importantly, their opinions with regard to the presentation of IT and CAT in the FET band.

3.5.2 Research Method

During the study, the researcher tried to determine from the questionnaire respondents and the interviewees whether educators lack basic ICT skills and pedagogical training, and whether a shortage of computer stations for the learners are some of the main problems that educators encounter while teaching CAT and IT at FET level. The researcher also tried to determine what other problems the educators came across.

A survey research method was chosen for the collection of data. Surveys permit the researcher to summarize the characteristics of different groups or to measure their attitudes and opinions towards some issue (Ary, Jacobs & Razavieh, 2002: 25). Data was gathered from individuals at schools. Interviews and questionnaires were used in order to determine the validity of the reviewed problems that educators encountered.

3.5.3 Population

A population is the universe or totality about which inference is made and conclusions are drawn (Lategan & Lues, 2005: 117). The population of this study was all secondary schools in the Mangaung area (Bloemfontein, Thaba

Nchu and Botshabelo) of the Free State Province, which present IT and/or CAT.

3.5.4 Sample

A sample is a selection of a population. Observations are made on the elements of the sample (Lategan & Lues, 2005: 117). Simple random sampling was used for the study. In simple random sampling, each member of the population under study has an equal chance of being selected and the probability of a member of the population being selected is unaffected by the selection of other members of the population (Litheko, 2005: 105 of 349). The sample of the study was educators teaching CAT and/or IT from fifteen secondary schools in the Mangaung area of the Free State.

The following secondary schools participated in the study:

Bloemfontein area:

- St. Michael's School
- St. Andrew's School
- Grey College
- Eunice High School
- Higher Technical School Louis Botha
- Fichardtpark High School
- Jim Fouche Hoërskool
- Bloemfontein High School
- Sentraal High School

Thaba Nchu area:

- Moroka High School
- Goronyane High School
- R.T. Mokgopa High School
- Albert Moroka School

Botshabelo area:

- Lenyora La Thuto High School
- Tshaba Se Maketse High School

The purpose of sampling is to enable the researcher to obtain the required information in a reliable way, without involving the entire population.

3.6 DATA COLLECTION METHODS AND INSTRUMENTS

In this study, data was gathered by means of questionnaires and interviews.

3.6.1 The Questionnaire

A questionnaire is a structured set of open-ended or closed questions, eliciting quantitative or qualitative information on one theme or topic and lending itself to data capture and analysis (Lategan & Lues, 2005: 117). A questionnaire is relatively economical, has the same questions for all subjects, can ensure anonymity, and contains questions written for specific purposes.

Permission to conduct research at the secondary schools was obtained from the director of the School of Teacher Education at the Central University of Technology, Free State. A letter was submitted by the researcher to the

school principals seeking permission to carry out the study at the school. The purpose of the study was explained in the letter.

A total of twenty questionnaires were printed and taken to fifteen secondary schools by the researcher. The researcher contacted the school principals beforehand to obtain permission to visit the educators at their schools. She then made appointments with the educators and visited them. She sat together with the educators, explained to them what the purpose of the questionnaire was and how important it was that they help the researcher complete the questionnaire. The educators completed the questionnaire in the presence of the researcher.

A letter was attached to each questionnaire which clearly showed that the research was for a Master's dissertation at the Central University of Technology, Free State. The questionnaire is a mere instrument to obtain information from the secondary school educators. The confidentiality of the questionnaire was also emphasized. At the beginning of the questionnaire, the topic of the research was indicated. The participants were advised not to sign their names, as the questionnaire was completely anonymous.

It took two months (August 2007 – September 2007) for the researcher to collect the information from the educators at the sampled secondary schools. The main focus of the questionnaire was to determine the problems that the educators encountered with the teaching of CAT/IT.

3.6.2 Interviews

An interview is defined as a specialized form of communication between people for a specific purpose associated with some agreed subject matter (Anderson *et al.* 1998: 190). Interviews give the researcher the opportunity to

probe deeper into what the educators think and feel. It also helps the researcher understand exactly what they meant when they answered the questionnaire. The interview technique is flexible and adaptable. Non-verbal as well as verbal behavior can be noted in face-to-face interviews, and the interviewer has an opportunity to motivate the respondent. Interviews result in a much higher response rate than questionnaires, especially for topics that concern personal qualities or negative feelings (Litheko, 2005: 80 of 349). The primary disadvantages of the interview are its potential for subjectivity and bias, its higher cost and time-consuming nature, and the lack of anonymity (Litheko, 2005: 80 of 349).

The unstructured interview was used as it allowed the researcher greater scope in asking questions in her own way. The researcher, however, had a framework of questions that provided structure and guidance.

The researcher made appointments with the educators in advance. The interviews took place in the educators' offices. The researcher introduced herself to the educators and explained to them the purpose of the interview. The confidentiality of the exercise was emphasized to assure the interviewees that the answers given by them were only going to be used for the purpose of the study.

According to the South African National Curriculum Statements for Grades 10-12, Computer Applications Technology (CAT) and Information Technology (IT) are two new subjects which are implemented in the Further Education and Training (FET) Band, as from the beginning of 2006 (DoE, 2003). Although the capabilities of the computer offer exciting possibilities for educators to expand and enhance the curriculum, there are still problems that may keep

educators from utilizing the full potential of the computer to teach. The significance of this research was to determine the problems that specific senior secondary schools encounter in the teaching of Computer Applications Technology (CAT) and Information Technology (IT) in the Bloemfontein area, Free State. Understanding the problems provides appropriate steps that could be taken to improve the management of the current situation on FET level and to ensure that the National Curriculum could be implemented more effectively.

The following questions were asked during the interview:

- Did you receive IT/CAT training when you were studying at university? (If YES, is the training enough for you to teach IT/CAT at school now?)
- Did you receive training from the school which you are working for? (If YES, what is the duration of the training?)
- Did you also receive the didactical training with respect to the teaching of IT/CAT?
- Do you want to receive more training?

After the above questions had been asked, the researcher took out the questionnaire and reviewed question 15 with the educators. Question 15 contained anticipated problems that affect educators as teachers of IT/CAT. Educators were required to indicate the one(s) that they encountered with an (x) and propose solutions to the problems. The researcher then worked through all the anticipated problems that were mentioned in the questionnaire. The educators were asked whether they had encountered the same problems and what their solutions would be, if indeed they had. Except the problems mentioned, they were also asked what other problems they came across and which solutions to the problems could they provide? By interviewing the educators, the researcher obtained a better and deeper understanding of the

problems that the educators encountered and had to deal with.

3.6.3 The Questionnaire

Two questionnaires were developed. One was designed for educators who teach CAT and another for educators who teach IT. The first section of both questionnaires was concerned with demographic details while the second section was concerned with questions regarding the problems that educators encountered with the teaching of CAT/IT in the FET band. The questionnaires are attached in the Appendices.

3.6.3.1 *Biographics*

The biographic variables which were assessed included the gender, current post level, age, teaching experience and qualification of the educators as well as the type of school at which the educators were teaching.

3.6.3.2 *Questions*

This section of the questionnaire was developed to determine the problems that educators encountered with the teaching of CAT and IT in the FET band. A questionnaire is a structured set of open-ended or closed questions, eliciting quantitative or qualitative information on one theme or topic and lending itself to data capture and analysis (Lategan & Lues, 2005: 117). Questionnaires are an inexpensive way to gather data from a potentially large number of respondents. They are a feasible way to reach a number of reviewers large enough to allow statistically sound analysis of the results. A well-designed questionnaire that is used effectively can gather information on the overall performance as well as information on specific components.

In order to design and administer a questionnaire with unambiguous questions, the researcher went through the following five steps: she defined the objectives of the survey, determined the sampling group, compiled the questionnaire, administered the questionnaire and interpreted the results.

In this study, English was used as the language of communication due to the fact that the researcher is a foreigner. The educators, who teach at the secondary schools where the research was done, were expected to be able to read, write and speak English fluently.

The following questions were asked in the questionnaire:

- Did you receive training in CAT / IT?
- From which type of institution did you receive training in CAT / IT?
- What was the duration of the training for CAT / IT?
- Did you receive any training with respect to the teaching of CAT / IT to FET-learners (Didactical training)?
- For which aspects of your teaching duties in CAT / IT did the content and/or didactical training that you received, not cater?
- Would you like to receive more subject related training for CAT / IT?
- In which areas of the content of CAT / IT would you like to receive more training?

Question No.15 lists some anticipated problems that affect educators as teachers of CAT/IT. The educators were required to indicate the problems that they encountered and propose solutions to the problems.

Question No.16 was the last question. Educators were asked whether they encountered any other problems. If they did, what was the problem and what was the proposed solution to the problem.

3.6.3.3 *Rationale for the development of the instrument*

In the literature review, it was mentioned that Information and Communication Technologies were driving significant changes in many aspects of human endeavor throughout the world (DoE, 2004: 8). ICT in education is also an incredible resource, which continues to be the single most important component of 21st century education. However, there are still problems that may keep educators from utilizing the full potential of the computer to teach the subjects CAT and IT.

It has been shown by Oberg and Gibson (1999: 239-252) that time limitations, pressure to cover the curriculum, lack of funds to purchase or upgrade hardware and/or software, and limited numbers of Internet connections are some constraints that educators are facing. Mentz and Mentz (2002: 9) discovered a few obstacles, such as insufficient financial support by the Department of Education; untrained educators; lack of electricity; the socio-economic status of the community; curriculum constraints; an unfavorable educator-learner ratio (usually more than 1:30) and a lack of classrooms suitable to serve as computer laboratories. Many more problems have been identified in the literature review.

According to the South African National Curriculum Statements for Grades 10-12, Computer Applications Technology (CAT) and Information Technology (IT) are two new subjects which are implemented in the Further Education and Training (FET) band, as from the beginning of 2006 (DoE, 2003). The researcher deemed it necessary to determine the problems that the educators encountered. A questionnaire was appropriate for collecting such data and was therefore developed.

3.7 DATA ANALYSIS

Descriptive statistics is a technique for organizing, summarizing and describing observations. Analyzing inferential statistics is a procedure that allows the researcher to make generalizations from sampled data to the population from which the sample was drawn (Ary *et al.*, 2002: 558, 561). Descriptive and inferential statistics were used in analyzing the data from the questionnaire (Burns, 2000: 43). The gathered information from respondents was organized and analyzed by the researcher. She first analyzed the data from the eight questionnaires which were answered by the IT educators. She either used tables or diagrams to present the data from each question. In order to present the result more clearly, the researcher also explained the tables or diagrams in words. Regarding the data from the interview, the researcher presented it in words. The researcher used the same way to analyze the data from the other twelve questionnaires which were answered by the CAT educators and their interviews.

3.8 SUMMARY

In this chapter, the researcher discussed the research approach, the research design, the population, the sample as well as the instrument. Interviews and questionnaires were used to gather the data. Descriptive and inferential statistics were used to analyze the data.

Chapter four will discuss the research results of the study.

CHAPTER 4

PROBLEMS ENCOUNTERED WITH THE TEACHING OF INFORMATION TECHNOLOGY AND COMPUTER APPLICATIONS TECHNOLOGY

4.1 INTRODUCTION

The purpose of this chapter is to present the results of the field work carried out to determine the problems that specific senior secondary schools encountered in the teaching of CAT and IT at FET level in the Mangaung area (Bloemfontein, Thaba Nchu and Botshabelo) of the Free State Province.

4.2 DATA COLLECTION METHODS USED TO ANSWER THE RESEARCH QUESTION

For the purpose of the study, two questionnaires were developed (refer to paragraph 3.6.3). One was designed for educators who teach CAT and another for educators who teach IT. The first section of both questionnaires was concerned with demographic details, and the respondents were asked the same questions. The second section was concerned with the problems that educators encountered with the teaching of CAT or IT in the FET band. The first section of chapter 4 deals with the statistics that describe the characteristics of the sample. The second section of this chapter presents the results from Section B of the questionnaire. It was designed for educators who teach IT and includes the results of the interview. The third section of this chapter presents the results from Section B of the questionnaire administered to educators who teach CAT and also includes the results of the interview.

4.3 RESULTS REGARDING THE PROFILE OF THE PARTICIPANTS

This section provides a demographic profile of the participants of the study.

4.3.1 Sample Characteristics

The sample comprised of 20 subjects for questionnaires and for interviews. All the participants who answered the questionnaires were interviewed as planned by the researcher. A total of twenty questionnaires were printed and distributed to fifteen secondary schools by the researcher. The researcher contacted the school principals firstly, obtained permission from the principals to execute the field work at their schools, made appointments with the educators and visited the schools. She sat together with the educators, explained to them what the purpose of the questionnaire was and how important it was for them to help the researcher complete the questionnaire. The educators completed the questionnaire in the presence of the researcher. This made all the questionnaires qualify for the study and indicated a response rate of 100%.

4.3.2 Biographical Information of Respondents and Graphical Representation

The questionnaires were composed of two sections. The first section was concerned with the respondents' demographic information. For the study, the biographic variables which were assessed included the gender, current post level, age, teaching experience and qualification of the educators, as well as the type of school at which the educators were teaching. The second section was composed of 17 questions which determined various possible problems encountered by educators who teach CAT and IT in the FET band. The respondents' demographic information will now be discussed.

4.3.2.1 Responses to gender

There were 20 respondents, 9 (45%) were female and 11 (55%) were male.

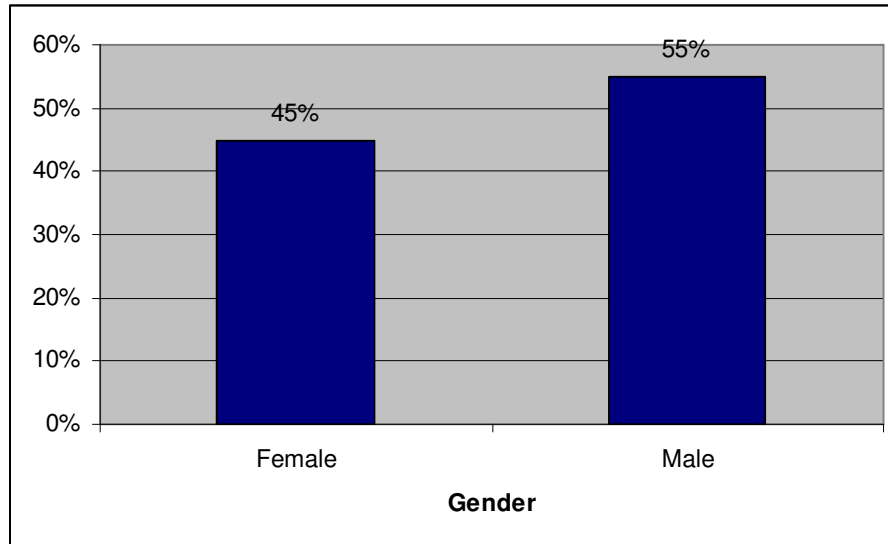


Figure 4.1: Gender distribution of respondents

4.3.2.2 Responses to current post level

As shown in Figure 4.2, 5 (25%) respondents were Heads of department, 14 (70%) respondents were teachers and 1 (5%) respondent was a subject head.

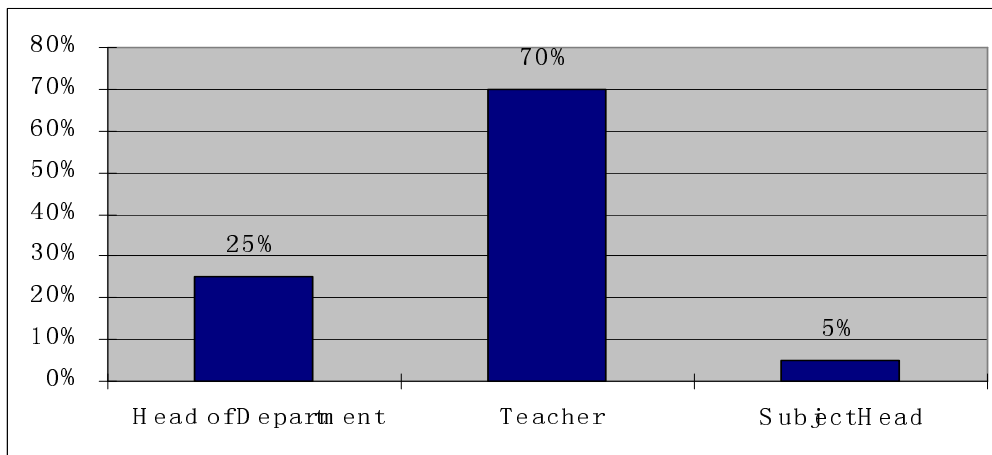


Figure 4.2: Post level distribution of respondents

4.3.2.3 Responses to age

Figure 4.3 tells us that 11 (55%) respondents were 30 years or younger, 5 (25%) respondents were between 31 and 40 years and 4 (20%) respondents were between 41 and 50 years.

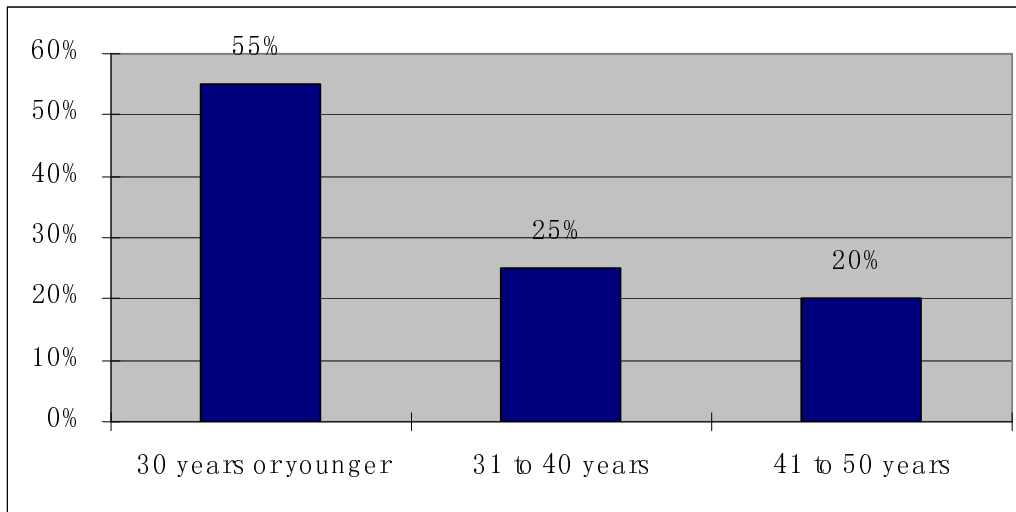


Figure 4.3: Age distribution of respondents

4.3.2.4 Responses to years of teaching experience

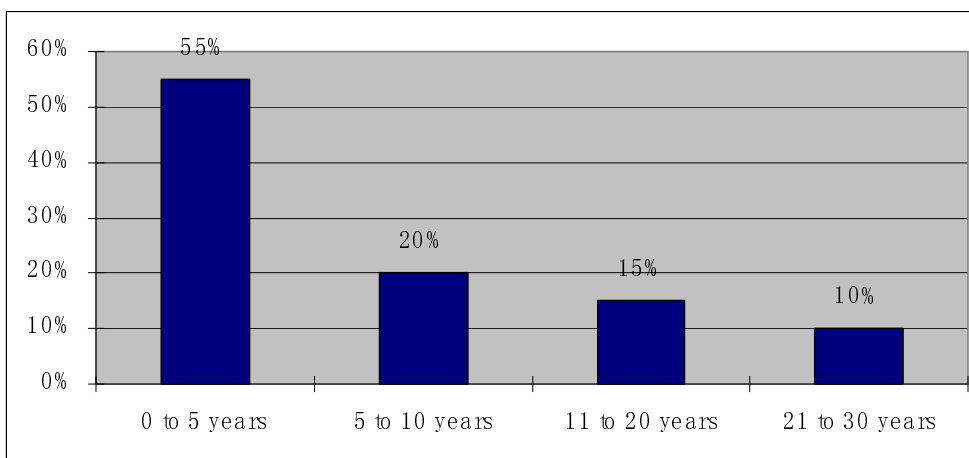


Figure 4.4: Responses according to years of teaching experience

Amongst the 20 respondents, 11 (55%) respondents had no more than 5 years

teaching experience. 4 (20%) respondents had 5 to 10 years teaching experience. 3 (15%) respondents had 11 to 20 years teaching experience and 2 (10%) respondents had 21 to 30 years teaching experience.

4.3.2.5 Responses to highest professional qualification

The respondents were asked what highest professional qualifications they had obtained.

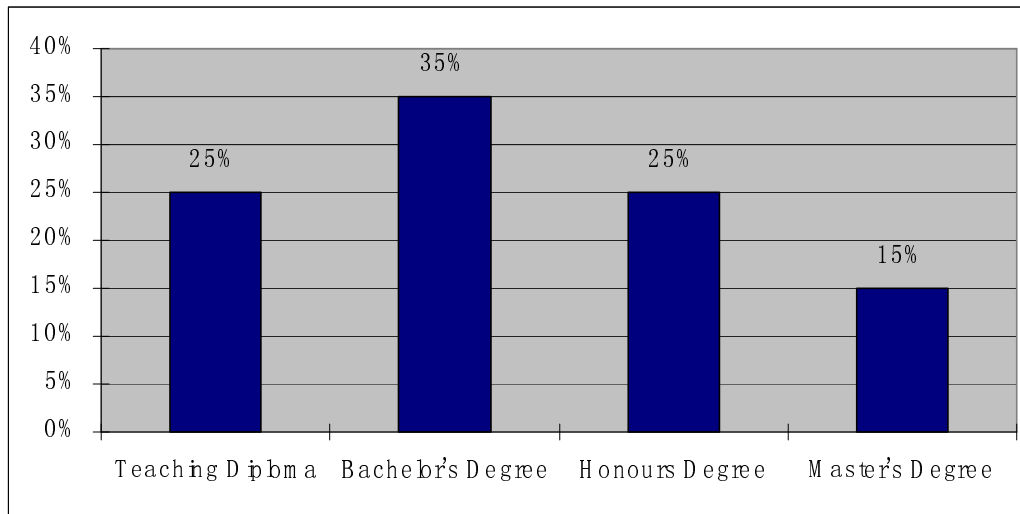


Figure 4.5: Responses according to level of education of respondents

5 (25%) respondents had only a Teaching Diploma, 7 (35%) respondents had a Bachelor's Degree, 5 (25%) respondents had an Honours Degree, and 3 (15%) respondents had a Master's Degree. Amongst the respondents nobody had a Doctorate Degree.

4.3.2.6 Responses to when the respondents obtained their highest professional qualification

Table 4.1: The year in which respondents obtained a highest professional qualification

Year of obtaining qualification	1976	1994	1995	1998	2002	2003	2004	2005
Number of respondents	1	2	1	3	1	4	7	1

Regarding the year in which respondents obtained their highest professional qualification, 1 (5%) respondent obtained his/her highest professional qualification in 1976, 2 (10%) respondents obtained their highest professional qualification in 1994, 1 (5%) respondent got his/her highest professional qualification in 1995. In 1998, 3 (15%) respondents obtained their highest professional qualification. In 2002, 1 (5%) respondent obtained his/her highest professional qualification. 4 (20%) respondents obtained their highest professional qualification in 2003, 7 (35%) respondents got their highest professional qualification in 2004 and 1 (5%) respondent obtained his/her highest professional qualification in 2005.

4.3.2.7 Responses to where the respondents obtained their highest professional qualification

Regarding the institution at which the respondents obtained their highest professional qualification, the data is as follows. 12 (60%) respondents obtained their highest professional qualification from the University of the Free State. 6 (30%) respondents obtained their highest professional qualification

from the Central University of Technology, Free State. 1 (5%) respondent obtained his/her highest professional qualification from Johannesburg University and 1 (5%) respondent obtained his/her highest professional qualification from Potchefstroom College.

Table 4.2: Institutions at which a highest qualification was obtained

Name of the institution	University of the Free State	Central University of Technology, Free State	Johannesburg University	Potchefstroom College
Number of respondents	12	6	1	1

4.3.2.8 Responses to which type of school the respondents were teaching at

There were 16 (80%) respondents teaching at public schools and 4 (20%) respondents teaching at state-aided/government subsidized schools.

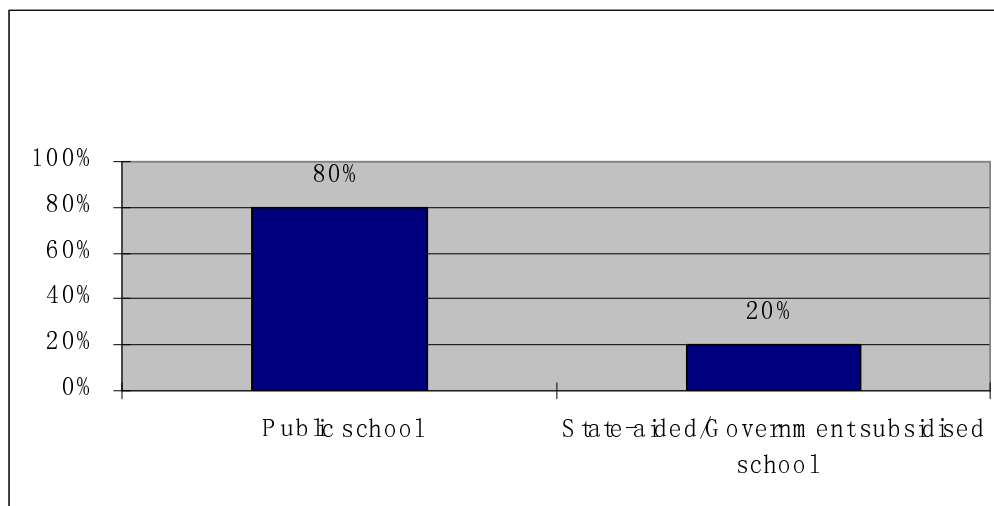


Figure 4.6: Responses according to which type of school the respondents

were teaching at

This concludes data regarding the demographic information of the respondents.

4.4 RESULTS REGARDING PROBLEMS THAT EDUCATORS ENCOUNTERED WITH THE TEACHING OF INFORMATION TECHNOLOGY

This section presents the results of Section B from the questionnaire which was designed for educators who teach IT. It also includes the results from their interviews. A total of 8 respondents completed the IT questionnaire. They were all interviewed.

4.4.1 Responses to Question 8

Question 8 asked educators whether or not they had received training in IT?

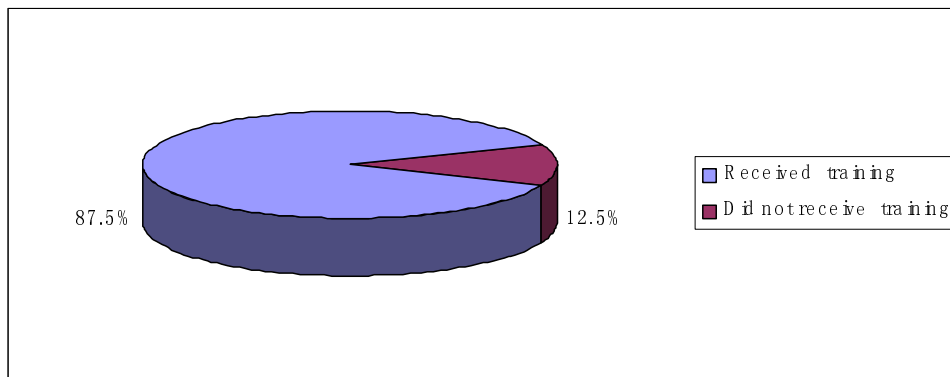


Figure 4.7: Responses according to whether respondents had received training in IT

7 (87.5%) respondents indicated that they had received training in IT, while 1 (12.5%) respondent indicated that he/she had not received any training in IT.

Regarding the training in IT, the respondents were asked the following questions during the interview:

- Did you receive IT training when you were studying at the university? (If YES, then is the training enough for you to teach IT at school now?)

5 of the respondents said they had received their training at university and that the training was enough for them to teach IT as a subject at school. 2 respondents said they had not received training at university.

- Did you receive training from the school which you are working for? (If YES, what is the duration of the training?)

None of the respondents received training in IT from the school at which they were teaching.

The respondent who indicated in the questionnaire that she did not receive training in IT explained to the researcher during the interview that she was too busy to join the training which the Department of Education provided. She complained that the school work was too much and did not leave any free time for development.

4.4.2 Responses to Question 9

The respondents who indicated that they had received training in IT in Question 8 had to answer Question 9. Question 9 asked from which type of institution the respondents received training in IT?

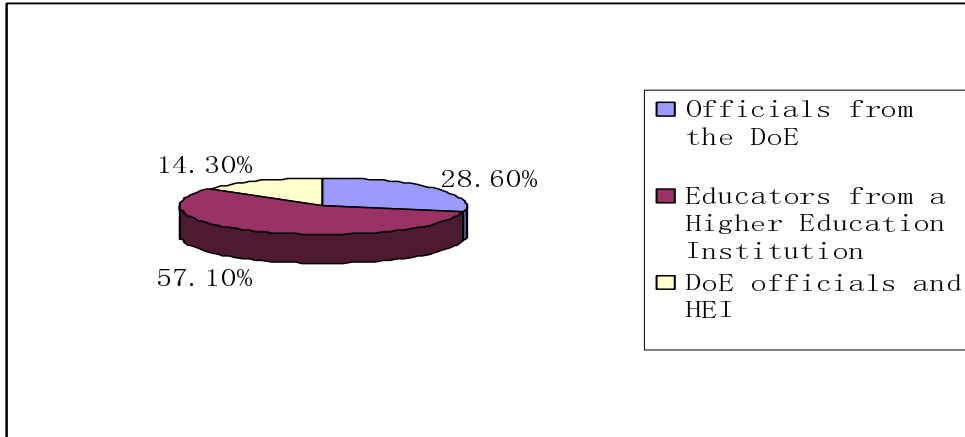


Figure 4.8: Responses according to which type of institution respondents received training in IT from

There was only 1 (14.3%) respondent who mentioned that he/she had received training from officials of the Department of Education (DoE) and from educators at a Higher Education Institution. There were 2 (28.6%) respondents who had received training only from DoE officials. There were 4 (57.1%) respondents who had received training only from educators at a Higher Education Institution.

4.4.3 Responses to Question 10

Question 10 asked the respondents what the duration of their training was?

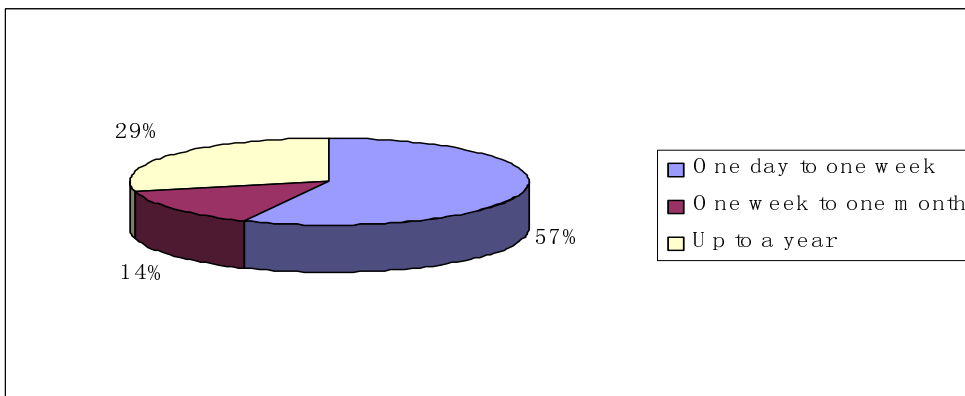


Figure 4.9: Responses according to the duration of the training in IT

Of the 7 respondents who indicated that they had received training in IT, 1 (14.3%) indicated that the duration of the training was one day to one week, 1 (14.3%) indicated that the training was between one week and one month, and 5 (71.4%) respondents indicated that the training they had received was up to one year.

4.4.4 Responses to Question 11

Question 11 asked whether the respondents had received didactical training with respect to the teaching of IT to FET-learners?

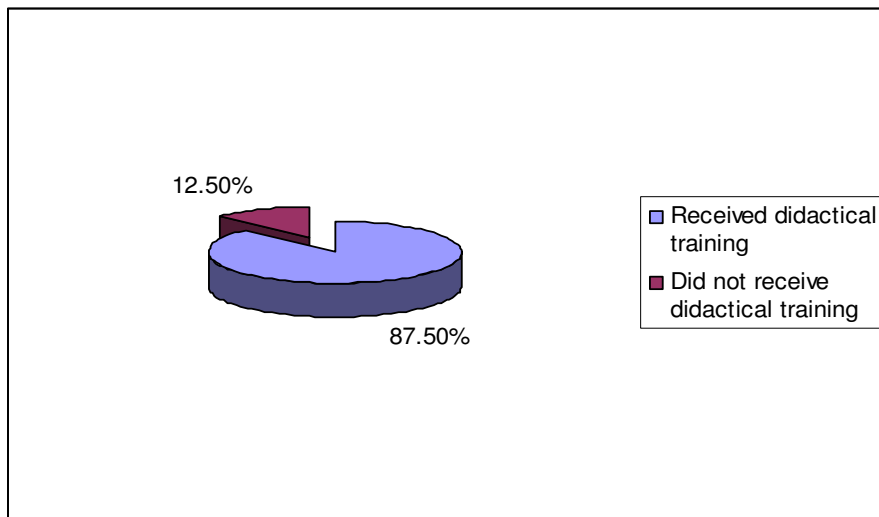


Figure 4.10: Responses according to whether respondents had received didactical training

1 (12.5%) respondent indicated that he/she had not received any didactical training with respect to the teaching of IT to FET-learners, while 7 (87.5%) respondents indicated that they had received didactical training in IT.

4.4.5 Responses to Question 12

The respondents who indicated that they had received didactical training in IT in Question 11 continued to answer Question 12. Question 12 asked which aspects of their teaching duties in IT were not catered for in the content and/or didactical training that they had received?

6 (86%) respondents indicated that the content and/or didactical training that they had received catered for all aspects of their teaching duties in IT. Only 1 (14%) respondent mentioned that the content and/or didactical training that the/she had received did not cover how to cope with disadvantaged kids and slow learners who do not have access to computer facilities at home.

4.4.6 Responses to Question 13

Question 13 asked the respondents whether they would like to receive more subject related training in IT?

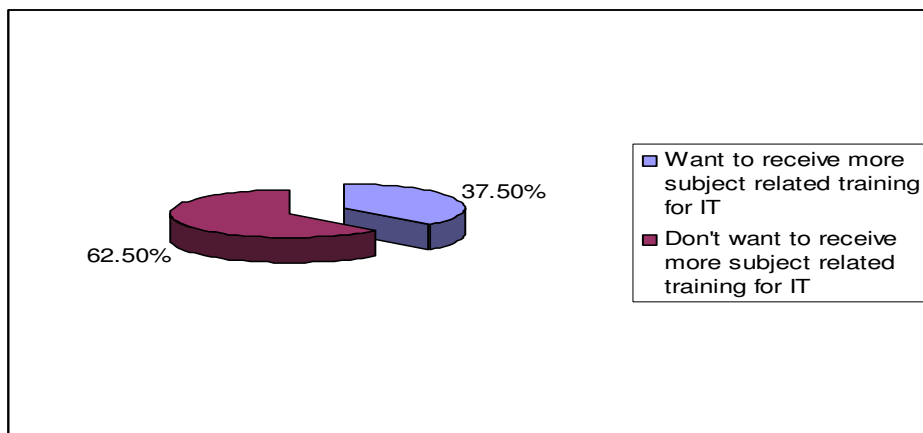


Figure 4.11: Responses according to whether respondents would like to receive more subject related training in IT

5 (62.5%) respondents indicated that they would like to receive more subject

related training in IT. 3 (37.5%) respondents, however, indicated that they would not and explained the reasons to the researcher during the interview. According to them the training from the Department of Education was too short and they had already learnt the knowledge which they would learn from the training.

4.4.7 Responses to Question 14

Question 14 determined which area of the IT content the respondents wanted to receive more training in?

2 (25%) respondents indicated that there was nothing they would like to receive training in. 6 (75%) respondents mentioned that they would like to receive training in the following areas: database management, final application development and implementation, advanced programming, and computer literature.

4.4.8 Responses to Question 15

In Question 15 the researcher listed anticipated problems that affect educators as teachers of IT. The respondents were required to indicate the problem(s) that they encountered and propose solutions to the problems. Table 4.3 summarizes the result of Question 15. The question was answered by all 8 respondents who teach IT.

Table 4.3 Responses to Question 15

Anticipated Problems	Number of educators who encountered the problems	Percentage
Lack of sufficient subject related training for teachers in IT	5	62.5%
Lack of sufficient didactical training for teachers in IT	1	12.5%
Not enough computers for learners	2	25%
Lack of financial support to provide relevant facilities, such as a computer laboratory and learning materials in IT.	2	25%
Learners don't have computers at home to practice on	3	37.5%
Overcrowded classrooms	4	50%
Learners use the computer for entertainment instead of academic matters	4	50%
Administrative problems, such as time-tabling	5	62.5%
Time constraints on the teacher's side	5	62.5%

When the researcher interviewed the educators, she took out the questionnaire which the educators completed and she reviewed question 15 with each educator. The researcher went through all the anticipated problems that were mentioned in the questionnaire and discussed possible solutions with the educators. The educators proposed the following solutions regarding the problems they encountered:

- Lack of sufficient didactical training for teachers in IT

Solutions: The Department of Education should provide training for educators; departmental meetings should be held more often to keep educators up-to-date; educators should be mentored and must go for a certificate examination.

- Not enough computers for learners

Solutions: The Department of Education should supply schools with enough computers; schools should organize the time effectively so that learners can share the available computers.

- Lack of financial support to provide relevant facilities, such as computer laboratories and learning materials in IT.

Solution: Schools should establish partnerships for sponsors or donations.

- Learners don't have computers at home to practice on

Solutions: Learners should have time in the afternoon to use the computers at school to do their homework on; educators should assign computer activities which can be completed during class time and leave theory activities for homework; computers at school should be made more accessible for learners.

- Overcrowded classrooms

Solutions: More IT educators should be employed; there should be a maximum of thirty learners and a minimum of twenty learners in one classroom.

- Learners use the computer for entertainment instead of academic matters

Solutions: Games should not be installed; schools should have a policy to control this matter.

- Administrative problems, such as time-tabling

Solutions: Computer lessons should not be taught after school only, but should be part of the normal school day on the time-table.

- Time constraints on the teacher's side

Solutions: Less paper work should be given to educators; schools should assign divisible tasks to educators so that each educator can have fewer tasks; the number of assessment tasks in IT should be reduced.

4.4.9 Responses to Question 16

Question 16 asked the respondents whether they encountered any other problems? If so, they were asked to specify and propose solutions to the problems.

2 (25%) respondents indicated that they did not encounter other problems. 6 (75%) respondents mentioned that except for the problems they indicated in Question 15, they also encountered the following problems, to which they also proposed some solutions:

- Learners lack discipline and this situation gets worse every year.

Solution: The respondent couldn't give any solutions to this problem.

- Some learners lack interest in IT studies.

Solution: Learners should be evaluated before being accepted as an IT learner.

- Some principals and educators were computer illiterate. They did not motivate learners to attend computer classes and considered it as time wasting.

Solution: Principals, educators, learners and parents must be made aware of the vital importance of this subject

- Text books for IT were not ready at the beginning of 2006.

Solution: The Department of Education must solve this problem.

- Educators spend too much time on paper work and do not have enough time for teaching.

Solution: Less paper work must be given to educators so that they can have more time to focus on teaching.

- The subject content in IT that has to be covered, is too broad.

Solution: The content of the subject must be reviewed by the Department of Education.

4.5 RESULTS REGARDING PROBLEMS THAT EDUCATORS ENCOUNTERED WITH THE TEACHING OF COMPUTER APPLICATIONS TECHNOLOGY

This section presents the results from Section B of the questionnaire which

was designed for educators who teach CAT. It also contains the results from their interviews. A total of 12 respondents completed the questionnaire. They were all interviewed.

4.5.1 Responses to Question 8

Question 8 asked educators whether or not they had received training in CAT?

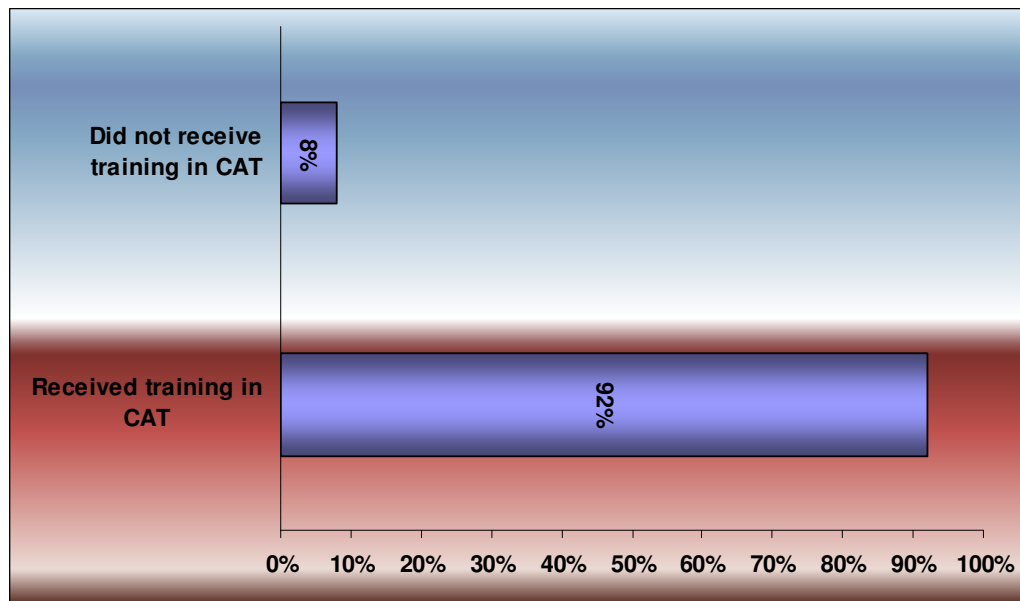


Figure 4.12: Responses according to whether respondents had received training in CAT

11 (92%) respondents indicated that they had received training in CAT, 1 (8%) respondent indicated that he/she had not received any training in CAT.

Regarding the training in CAT, the respondents were asked the following questions during their interviews:

- Did you receive CAT training when you were studying at the university? (If YES, then is the training enough for you to teach CAT at school now?)

7 of the respondents said that they had received their training at university and that the training was enough for them to teach CAT as a subject at school. 4 respondents said they had not received training at university.

- Did you receive training from the school which you are working for? (If YES, what is the duration of the training?)

None of the respondents had received training in CAT from the school at which they were teaching.

4.5.2 Responses to Question 9

The respondents who indicated that they had received training in CAT in Question 8 needed to answer Question 9. Question 9 determined the type of institution from which the respondents had received training in CAT.

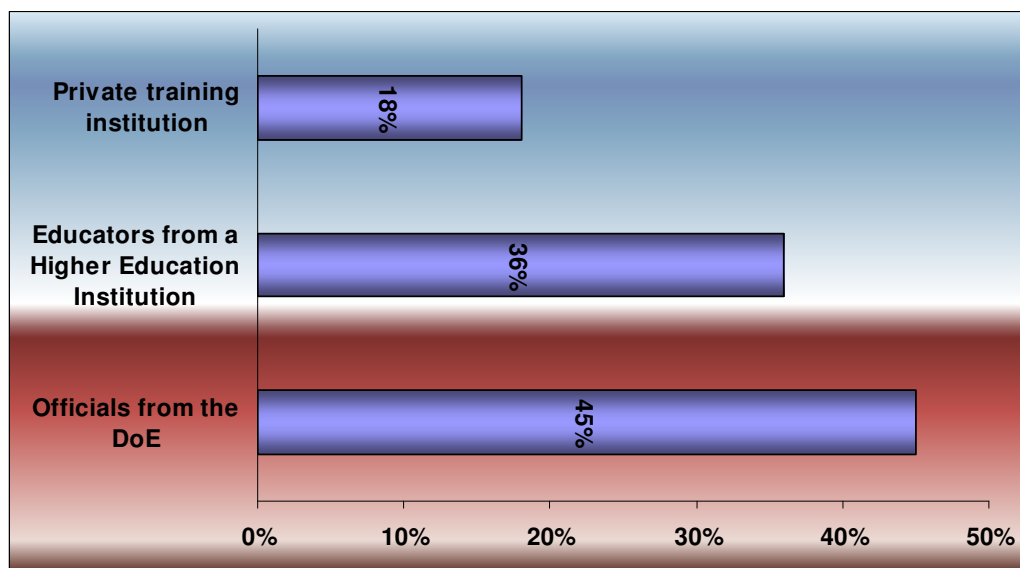


Figure 4.13: Responses according to which type of institution respondents had received training in CAT from

2 (18%) respondents indicated that they had received training in CAT from a

private training institution, 4 (36%) respondents mentioned that they had received training in CAT from educators from a Higher Education Institution and 5 (45%) respondents indicated that the training they had received was from officials from the DoE.

4.5.3 Responses to Question 10

Question 10 asked the respondents what the duration of their training was?

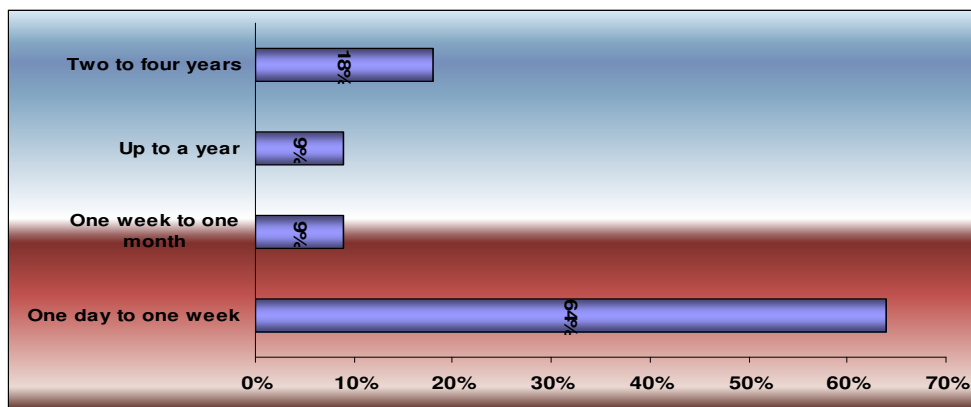


Figure 4.14: Responses according to the duration of the training for CAT for the respondents

Of the 11 respondents who indicated that they had received training in CAT, 7 (64%) indicated that the duration of the training varied between one day and one week, 1 (9%) indicated that the training was between one week and a month, 1 (9%) respondent indicated that the training he/she had was up to one year and 2 (18%) respondents indicated that the duration of the training was between two and four years.

4.5.4 Responses to Question 11

Question 11 asked whether the respondents had received didactical training with respect to the teaching of CAT to FET-learners?

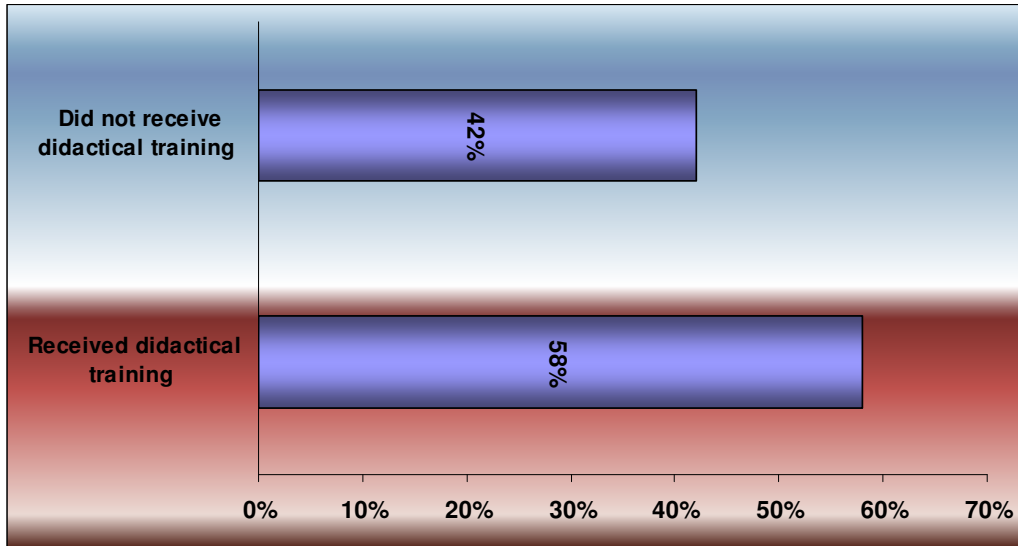


Figure 4.15: Responses according to whether respondents received didactical training

5 (42%) respondents indicated that they had not received any didactical training with respect to the teaching of CAT to FET-learners, while 7 (58%) respondents indicated that they had received didactical training in CAT.

4.5.5 Responses to Question 12

The respondents who indicated that they had received didactical training in CAT in Question 11 continued to answer Question 12. Question 12 asked which aspects of their teaching duties in CAT were not catered for in the content and/or didactical training that they had received?

4 (57%) respondents indicated that the content and/or didactical training that they had received catered for all aspects of their teaching duties in CAT. 1 (14%) respondent mentioned that the content training that he/she had received could not enable him/her to teach the learners how to type. 2 (29%) respondents mentioned that CAT as a subject only provides basic knowledge of EXCEL and ACCESS, and that the theory of the subject was not enough.

4.5.6 Responses to Question 13

Question 13 asked the respondents whether they would like to receive more subject related training in CAT?

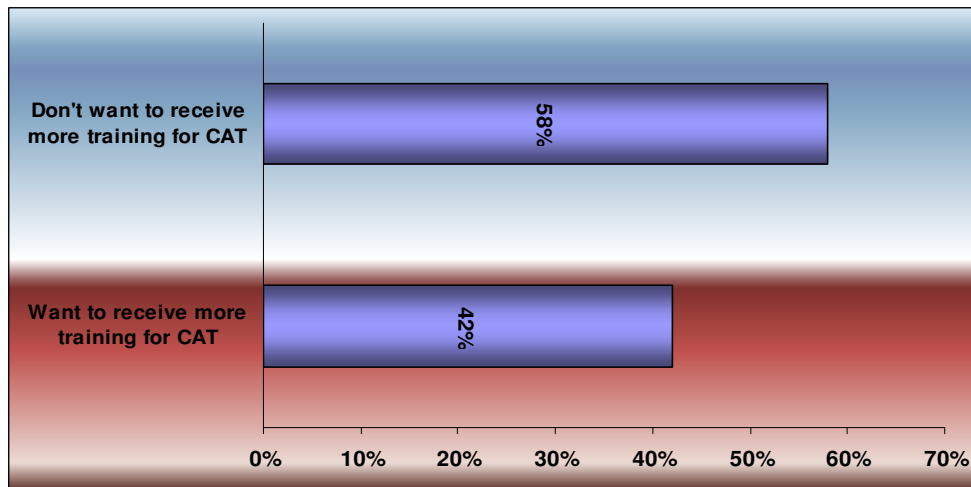


Figure 4.16: Responses according to whether respondents would like to receive more training in CAT

5 (42%) respondents indicated that they would like to receive more subject related training in CAT. 7 (58%) respondents, however, indicated that they would not. When these 7 respondents were interviewed by the researcher, 5 of them said that the training from the Department of Education was too short and too simple. 2 of them said it was difficult to make time for the training.

4.5.7 Responses to Question 14

Question 14 wanted to determine which area of the CAT content the respondents wanted to receive more training in?

7 (58%) respondents indicated that there was nothing they would like to receive training in. 5 (42%) respondents mentioned that they would like to

receive training in the following areas: File management, *Excel*, *Access*, *Power point*, and the theory of CAT.

4.5.8 Responses to Question 15

In Question 15, the researcher listed some anticipated problems that affect educators as teachers of CAT. The respondents were required to indicate the problem(s) that they encountered. Table 4.4 summarizes the result of Question 15. The question was answered by all 12 respondents who teach CAT.

Table 4.4 Responses to Question 15

Anticipated Problems	Number of educators who encountered the problems	Percentage
Lack of sufficient subject related training for teachers in CAT	6	50%
Lack of sufficient didactical training for teachers in CAT	6	50%
Not enough computers for learners	7	58%
Lack of financial support to provide relevant facilities, such as a computer laboratory and learning materials in CAT.	7	58%
Learners don't have computers at home to practice on	8	67%
Overcrowded classrooms	10	83%
Learners use the computer for entertainment instead of academic matters	5	42%

Anticipated Problems	Number of educators who encountered the problems	Percentage
Administrative problems, such as time-tabling	5	42%
Time constraints on the teacher's side	9	75%

When the researcher interviewed the educators, she took out the questionnaire which the educators completed and she reviewed question 15 with each educator. The researcher went through all the anticipated problems that were mentioned in the questionnaire and discussed possible solutions with the educators. The educators proposed the following solutions regarding the problems that they encountered:

- Lack of sufficient subject related training for teachers in CAT

Solution: Educators should be given the opportunity to attend workshops.

- Lack of sufficient didactical training for teachers in CAT

Solution: The Education Department should provide more in-service training for CAT educators.

- Not enough computers for learners

Solutions: Schools should try to motivate computer companies to donate computers; schools should seek for sponsorships; the Department of Education must supply schools with enough computers; no more than twenty

learners should be in one CAT class.

- Lack of financial support to provide relevant facilities, such as computer laboratories and learning materials in CAT

Solutions: Schools should establish partnerships with sponsors for donations; businesses as well as other institutions should sponsor disadvantaged schools; the government must try to help disadvantaged schools with financing.

- Learners don't have computers at home to practice on

Solutions: Computer laboratories should be open in the afternoons for learners to work on; parents should be encouraged to buy a computer for their children to use at home.

- Overcrowded classrooms

Solutions: No more than twenty learners should be put in one computer class; at each school, there should be at least four CAT educators.

- Learners use the computer for entertainment instead of academic matters

Solutions: The computer laboratories in schools should not have access to the Internet all the time unless it is necessary; game programmes should not be installed.

- Administrative problems, such as time-tabling

Solutions: Computer lessons should not be taught after school only, but should be part of the normal school day on the time-table.

- Time constraints on the teacher's side

Solutions: Less paper work should be given to educators; the number of assessments in CAT should be reduced; the CAT educators become “do-it-all” teachers, who have to fix the computers, write programmes, design school websites, etc. This situation must stop. Schools should employ other people to do the above-mentioned jobs so that educators can have more time to teach.

4.5.9 Responses to Question 16

Question 16 asked the respondents whether they encountered any other problems?

8 (67%) respondents indicated that they did not encounter other problems. 4 (33%) respondents mentioned that apart from the problems they indicated in Question 15, they also encountered the following problems to which they proposed solutions:

- Too much assessment in the subject.

Solution: Less assessment should be assigned to the subject.

- Some learners could not type and there was no time to teach them.

Solution: Learners must be encouraged to practice typing by themselves in their spare time.

- Some computers were stolen at schools

Solution: Schools must enhance their security and insure their computers.

4.6 SYNTHESIS OF THE RESEARCH QUESTION

The research question reads as follows: what problems are encountered by educators who teach Computer Applications Technology and Information Technology in the FET band according to the National Curriculum Statement (NCS)?

After the researcher analyzed the second part of the questionnaire and interviewed all the respondents, it was found that it did not matter what post level the respondents were on, how old they were, how many years teaching experience they had, what their highest professional qualifications were, when and where they obtained their highest qualification, or which type of school they were teaching at, all the respondents encountered problems regarding the teaching of CAT and/or IT at FET level.

According to the results of the research, the following problems regarding the teaching of IT were encountered:

- A lack of sufficient didactical training for teachers in IT;
- Learners don't have computers at home to practice on;
- A lack of financial support to provide relevant facilities to schools, such as computer laboratories and learning materials in IT;
- There are not enough computers for learners at school;
- Learners use the computers for entertainment instead of academic matters;
- Overcrowded classrooms;
- Administrative problems, such as time-tabling;
- Time constraints on the teacher's side;

- Learners lack discipline and this situation gets worse every year;
- Some learners lack an interest in IT studies;
- Some principals and educators are computer illiterate, and do not motivate learners to attend computer classes. They consider it as time wasting;
- Text books for IT were not ready at the beginning of 2006;
- Educators spend too much time on paper work and do not have enough time for teaching;
- IT as a subject attempts to cover a content spectrum which is too broad.

The following problems regarding the teaching of CAT were encountered:

- A lack of sufficient subject related training for teachers in CAT;
- A lack of sufficient didactical training for teachers in CAT;
- Learners don't have computers at home to practice on;
- A lack of financial support to provide relevant facilities for schools, such as computer laboratories and learning materials in CAT;
- There are not enough computers for learners at school;
- Learners use computers for entertainment instead of academic matters;
- Overcrowded classrooms;
- Administrative problems, such as time-tabling;
- Time constraints on the teachers' side;
- Too much paper work for CAT teachers;
- CAT teachers become 'do-it-all' teachers with regard to any work on the computer, such as fixing the computer and designing school websites;
- Some learners cannot type and there is no time to teach them;
- Too many assessments in the subject;
- Some computers were stolen at school.

The following table illustrates the common and different problems that the IT and CAT educators encountered.

Table 4.5 Common and different problems that IT and CAT educators encountered

Problems regarding the teaching of IT and CAT	IT educators encounter	CAT educators encounter
A lack of sufficient didactical training for teachers		
A lack of sufficient subject related training for teachers		
Learners don't have computers at home to practice on		
A lack of financial support to provide relevant facilities to schools		
There are not enough computers for learners at school		
Learners use the computers for entertainment instead of academic matters		
Overcrowded classrooms		
Administrative problems, such as time-tabling		
Time constraints on the teacher's side		
Learners lack discipline and this situation gets worse every year		
Some learners lack an interest in IT studies		
Some principals and educators do not motivate learners to attend computer classes		
Text books for IT were not ready at the beginning of 2006		
Educators spend too much time on paper work and do not have enough time for teaching		
IT as a subject attempts to cover a content spectrum which is too broad		
Teachers become 'do-it-all' teachers		
Some learners cannot type and there is no time to teach them		
Too many assessments in the subject		
Some computers were stolen at school		

encounter not encounter

4.7 A DISCUSSION OF THE ASSUMPTIONS OF THE STUDY

In Chapter 2, the literature review indicated that educators encountered many problems while they were teaching ICTs. Those problems include time limitations, pressure to cover the curriculum, lack of funds to purchase or upgrade hardware and/or software, difficulty with using the Internet by low-achieving learners, limited number of Internet connections and so on.

However, based on the real situation in Bloemfontein, the researcher made the following assumptions: many educators lack basic ICT skills, because they did not receive adequate computer training while at university. Training in the skills of how to use ICT equipment and how to use ICTs to effectively manage learners' learning, both during the lesson and also in the preparation of lessons before-hand (pedagogical training), is also inadequate. Another obstacle is that there are not enough computer stations for the learners. This situation prevents educators from effectively teaching CAT and IT.

In order to find out whether the assumptions were true or not, the researcher designed and handed out questionnaires, in which she asked the educators questions like: Did you receive training in IT/CAT (Refer to Paragraph 4.4.1 and Paragraph 4.5.1)? What was the duration of the training (Refer to Paragraph 4.4.3 and Paragraph 4.5.3)? Did you receive any training with respect to the teaching of IT/CAT to FET-learners (Didactical training) (Refer to Paragraph 4.4.4 and Paragraph 4.5.4)? The researcher also pointed out some anticipated problems and let the educators indicate whether they encountered them or not. These anticipated problems included: lack of sufficient subject related training for teachers in IT/CAT, lack of sufficient didactical training for teachers in IT/CAT, not enough computers for learners, learners don't have computers at home to practice on, etc. (Refer to Paragraph 4.4.8 and Paragraph 4.5.8).

According to the result from the questionnaire, the assumptions that the researcher made are true.

4.8 SUMMARY

This chapter dealt with the results of the study. The results of the statistical analysis were presented for the gender, post level, age, teaching experience, level of education, time and place of obtaining a highest qualification as well as the type of school at which the teaching was taking place. The results of the questionnaire and interviews were also presented. The researcher used graphs and tables as tools to present the results. The problems that the educators encountered regarding the teaching of IT and CAT were determined. The assumptions that the researcher made were proven to be true.

The last chapter, Chapter 5, will contain the conclusions with regard to the research and propose recommendations to teachers in their future teaching of CAT and IT.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter will present the rationale for the study, conclusions regarding the research question (refer to paragraph 1.4), the main contribution of the study and recommendations for improvement.

5.2 RATIONALE

Across the world developed and developing countries have, in recent years, revised their school and higher education curricula to take account of the knowledge and skills required to participate in a globalizing 21st century world. In South Africa, the Department of Education also introduced a new curriculum in Grades 10, 11 and 12 as from the beginning of 2006. The new curriculum is internationally benchmarked and will require the knowledge and skills to actively participate in, and contribute to, a democratic South African society and economy.

The subjects in the National Curriculum Statement are updated and expanded versions of subjects previously offered in South African schools. Information Technology (IT) and Computer Applications Technology (CAT) are two of the new subjects which were implemented in the Further Education and Training (FET) Band as from 2006. Because IT and CAT are new subjects, educators have problems teaching them. The purpose of this study is to determine what problems educators encounter when they teach IT and CAT. Understanding the problems leads to appropriate steps that could be taken to improve the management of the current teaching situation at FET level and to ensure that

the National Curriculum Statement can be implemented more effectively. Then young South Africans will be better able to acquire the knowledge, skills, values and attitudes they need to realize their potential, to contribute to social and economic development, to participate fully in the life of the country, to compete internationally, and to build successful communities.

5.3 CONCLUSIONS REGARDING THE RESEARCH QUESTION

The research question was formulated as follows:

What problems are encountered by educators who teach Computer Applications Technology and Information Technology in the FET band according to the National Curriculum Statement (NCS)?

According to the findings, the researcher identified the following problems:

- A lack of sufficient didactical training for educators;
- Learners don't have computers at home to practice on;
- A lack of financial support to provide relevant facilities for schools, such as computer laboratories and learning materials in IT/CAT;
- At school, there are not enough computers for learners;
- Learners use the computer for entertainment instead of academic matters;
- Overcrowded classrooms;
- Administrative problems, such as time-tabling;
- Time constraints on the teacher's side;
- Learners lack discipline, this situation gets worse every year;
- Some learners lack interest in IT/CAT studies;
- Some principals and educators are computer illiterate, they do not motivate learners to attend computer class and consider it as time wasting;
- Text books for IT/CAT were not ready at the beginning of 2006;

- Educators spend too much time on paper work and do not have enough time for teaching;
- IT as a subject attempts to cover a content spectrum which is too broad;
- IT/CAT teachers become 'do-it-all' teachers with regard to any work on the computer, such as fixing the computer, designing school website;
- Some learners cannot type and there is no time to teach them;
- Too many assessments in the subject CAT;
- Some computers get stolen at school.

Understanding the above problems leads to appropriate steps that could be proposed to try to solve the problems, so that IT and CAT could be implemented more successfully.

5.4 THE MAIN CONTRIBUTION OF THE STUDY

The main contribution of the study lies in the identification of problems (refer to paragraph 5.3) that specific senior secondary schools in the Bloemfontein area, Free State, encounter in the teaching of CAT and IT.

The study furthermore tried to inform learners, parents, educators, the Department of Education, and all other stakeholders of the importance of IT and CAT as school subjects on FET level.

The problems that were determined by the researcher will make the Department of Education and the stakeholders understand the current teaching and learning situation better. By knowing and understanding the problems, the Department of Education and the stakeholders will seek solutions to rectify the problems. If the problems can be lessened or solved, the implementation of IT and CAT will be more successful, which is good for the learners, because implementing CAT and IT successfully will improve and

provide learners with the skills needed in an information economy. ICTs can also improve learning and the life chances of learners after school. It is also good for the social and economic development in South Africa.

The findings of the study will also be beneficial for those schools which teach IT or CAT. They can try to avoid some of the existing problems, already knowing about them beforehand.

In order to solve/lessen the existing problems and improve the management of the current teaching and learning situation, the researcher made recommendations which the schools, Department of Education, and other stakeholders can take into consideration. These are discussed in detail in paragraph 5.5.

5.5 RECOMMENDATIONS

This part of the chapter deals with the recommendations that need to be considered in order to improve the management of the current teaching and learning situation at FET level and to ensure that the National Curriculum Statement in IT and CAT can be implemented more effectively.

5.5.1 Educational Management

Van der Westhuizen P.C. (2002: 55), describes that educational management is a specific type of work in education which comprises those regulatory tasks or actions executed by a person or body in a position of authority in a specific field or area of regulation, so as to allow formative education to take place.

5.5.2 Different Emphases In Management

In order to have a better understanding of management, we will now consider the different emphases in management.

5.5.2.1 *Management as achieving objectives*

Management as achieving objectives lays the emphasis on utilizing the necessary people, materials and means as effectively as possible in order to achieve certain aims (Van der Westhuizen P.C., 2002: 38).

5.5.2.2 *Management as a series of consecutive actions*

Management is regarded as consecutive actions which form a continuous cycle of planning, organizing, guiding, supervising and controlling in order to reach previously set goals (Van der Westhuizen P.C., 2002: 39).

5.5.2.3 *Management as decision making*

Management as a decision making principle concerns how people are led to do that which has to be done. It involves making the right decisions so that goals can be achieved effectively through certain actions (Van der Westhuizen P.C., 2002: 39).

5.5.2.4 *Management as co-ordination*

Co-ordination is regarded as the core management principle because there should be continual reconciliation between conflicting interests in a school to facilitate the achievement of goals through the co-ordination of diverse tasks (Van der Westhuizen P.C., 2002: 40).

5.5.2.5 Management as leading and guiding

Management is described as leading and guiding, because people are influenced by activities or tasks in such a way that they will willingly work and strive towards achieving the goals of the group.

5.5.3 Recommendations regarding the identified problems

The following recommendations were made regarding the problems that the researcher found.

The Department of Education must review the curriculum of IT and CAT in order to make the content more clear and specific. Assessment in these two subjects should not be more than twice per semester (Refer to problems mentioned in paragraph 4.4.9 and paragraph 4.5.9).

Sufficient subject related training and didactical training for IT and CAT educators should be provided by the Department of Education on a regular basis. It should be made compulsory for IT and CAT educators to attend the training. On a quarterly basis there should be regular national workshops for IT and CAT educators for capacity building (Refer to problems mentioned in paragraph 4.4.8 and paragraph 4.5.8).

The Department of Education should try to help schools with finance, so that schools are able to purchase updated computer software, buy enough computers for learners and at least have one computer laboratory. Schools must try to seek sponsorships. For example, schools can ask the big local companies to donate computers for learners (Refer to problems mentioned in paragraph 4.4.8 and paragraph 4.5.8).

There should not be too many learners in one computer class, with no more than twenty learners per class. The Department of Education should appoint enough IT and CAT educators per school. Schools must employ staff to do other computer related jobs, such as fixing or maintaining computers, so that IT and CAT educators can have more time to concentrate on teaching (Refer to problems mentioned in paragraph 4.4.8 and paragraph 4.5.8).

Schools must make all the educators, parents and learners aware that IT and CAT are very important subjects. They teach skills that learners must master in order to get jobs in the future. IT and CAT lessons must be taught during school hours. Games programmes should not be installed on school computers. Learners should not be allowed to use computers for entertainment instead of academic matters. Parents should be encouraged to buy computers for their children to use at home (Refer to problems mentioned in paragraph 4.4.8 and paragraph 4.5.8).

Computers are expensive. In case they get stolen or damaged, schools must enhance their security and insure all the computers as well as other expensive software and equipment (Refer to problems mentioned in paragraph 4.4.9).

It is very important that IT and CAT educators must be life-long learners. They must upgrade their subject knowledge all the time.

5.5.4 How the Recommendations Can Improve the Management Of The Current Teaching And Learning Situation

From paragraph 5.5.1 and paragraph 5.5.2, management can simply be described as the process of planning, leading, organizing and guiding people within a group in order to achieve set-goals. Here the goal is to improve the management of the current teaching and learning situation in IT and CAT.

The recommendations made by the researcher will assist with this. A diagram illustrates the approach.

Management:

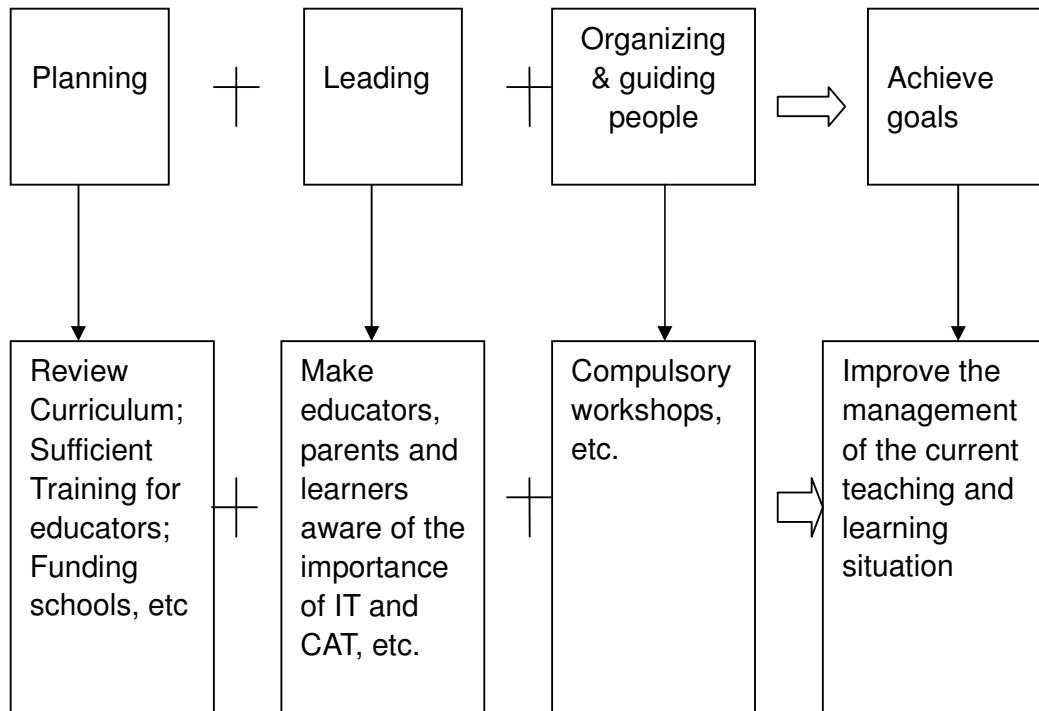


Diagram 5.1: An illustration of how the researcher’s recommendations can improve the management of the current teaching and learning situation

As the researcher mentioned earlier in this paragraph, management is described as the process of planning, leading, organizing and guiding people within a group in order to achieve set-goals. In paragraph 5.5.3, the researcher recommends that the curriculum needs to be reviewed, sufficient training should be provided for educators, schools should be funded, etc., which is the process of planning. The researcher also recommends that educators, parents and learners should be made aware of the importance of IT and CAT, etc., which is part of the leading process. In the same paragraph, the researcher suggests there should be compulsory workshops for educators,

which is the process of organizing and guiding people. By doing what the researcher recommends, the goal, which is to improve the management of the current teaching and learning situation, should be achieved.

5.6 SUMMARY

In this last chapter of the study, the researcher drew conclusions regarding the research question. She highlighted the main contribution of the study and made recommendations to the Department of Education, schools, educators and parents.

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APPENDIX

APPENDICE A: questionnaire for CAT 86
APPENDICE B: questionnaire for IT 92

APPENDICE A

Dear Respondent

The **Questionnaire** is for academic purposes, namely to obtain an M. Ed: Educational Management **at the CENTRAL UNIVERSITY OF TECHNOLOGY, FREE STATE.**

It is based on the project entitled:

“PROBLEMS ENCOUNTERED WITH THE TEACHING OF COMPUTER APPLICATIONS TECHNOLOGY AND INFORMATION TECHNOLOGY AT SENIOR SECONDARY SCHOOL LEVEL: A MANAGERIAL PERSPECTIVE”

The purpose of the questionnaire is to offer you an opportunity to raise problems you encountered in teaching Computer Application Technology (CAT) and/or Information Technology (IT). The questionnaire is a mere instrument to obtain information from the secondary school educators in **BLOEMFONTEIN, FREE STATE PROVINCE.**

Your responses are confidential and will not be identified by your name and/or your secondary school.

M. Ed student

Li Rijuan

PROBLEMS ENCOUNTERED WITH THE TEACHING OF COMPUTER APPLICATIONS TECHNOLOGY AND INFORMATION TECHNOLOGY AT SENIOR SECONDARY SCHOOL LEVEL: A MANAGERIAL PERSPECTIVE

This questionnaire is for **teachers teaching Computer Application Technology (CAT)** in the FET Band in the **Free State Province**.

Your responses will remain strictly **CONFIDENTIAL**. Your identity will remain **ANONYMOUS**, please **DO NOT** sign your name.

**QUESTIONNAIRE
SECTION A**

BIOGRAPHICAL DETAILS OF RESPONDENT

Please indicate your response by putting a cross [x] in the appropriate block

1. Your gender

- | | |
|-----------------|---|
| a) Male..... | 1 |
| b) Female | 2 |

2. Your current post level

- | | |
|----------------------------|---|
| a) Principal..... | 1 |
| b) Deputy Principal..... | 2 |
| c) Head of Department..... | 3 |
| d) Subject Head..... | 4 |
| e) Teacher | 5 |

3. Your present age

- | | |
|-----------------------------|---|
| a) 30 years or younger..... | 1 |
| b) 31 to 40 years..... | 2 |
| c) 41 to 50 years..... | 3 |
| d) Older than 50 years..... | 4 |

4. Your teaching experience in years

- | | |
|----------------------------|---|
| a) 0 to 5 years | 1 |
| b) 5 to 10 years..... | 2 |
| c) 11 to 20 years..... | 3 |
| d) 21 to 30 years..... | 4 |
| e) More than 30 years..... | 5 |

5. Your highest professional qualification

- | | |
|---------------------------|---|
| a) Teaching Diploma..... | 1 |
| b) Bachelor's Degree..... | 2 |
| c) Honours Degree..... | 3 |
| d) Master's Degree..... | 4 |
| e) Doctorate..... | 5 |
| f) Other (Specify)..... | 6 |

6. When and where did you obtain your highest qualification? (for example, 2002, UFS)?

7. In which type of school are you teaching?

- | | |
|---------------------------------------------|---|
| a) Public School..... | 1 |
| b) State-Aided / Government Subsidised..... | 2 |
| c) Private School..... | 3 |
| d) Other, specify..... | 4 |

SECTION B

The questions in this section pertain to CAT related training. Please answer the questions as honestly as possible.

8. Did you receive training in CAT?

- | | |
|-------------|---|
| a) YES..... | 1 |
| b) NO..... | 2 |

If your answer to question 8 is YES, answer Question 9

9. From which type of institution did you receive training in CAT?

- | | |
|--------------------------------------------------------------------|---|
| a) Officials from the DoE..... | 1 |
| b) Representatives from Non-Government Organisations (NGO'S) | 2 |
| c) Educators from a Higher Education Institution..... | 3 |
| d) Private training institutions | 4 |
| e) Other (please specify)..... | 5 |

10. What was the duration of the training for CAT?

- | | |
|-------------------------------|---|
| a) One day to one week | 1 |
| b) One week to one month..... | 2 |
| c) Up to a year | 3 |
| d) Two to four years | 4 |
| e) Other, specify | 5 |

11. Did you receive any training with respect to the teaching of CAT to FET-learners (Didactical training)?

- | | |
|--------------|---|
| a) YES | 1 |
| b) NO | 2 |

If you answered YES to question 11, please answer question 12.

12. For which aspects of your teaching duties in CAT did the content and/or didactical training that you received, not cater?

13. Would you like to receive more subject related training for CAT?

- | | |
|--------------|---|
| a) YES | 1 |
| b) NO..... | 2 |

14. In which areas of the content of CAT would you like to receive more training on?

15. The following are anticipated problems that affect educators as teachers of CAT. Please indicate the one(s) that you encounter with an (x) and propose solutions to the problems.

- a) Lack of sufficient subject related training for teachers in CAT())
Your solution: _____

- b) Lack of sufficient didactical training for teachers in CAT())
Your solution: _____

- c) Not enough computers for learners.....()
Your solution: _____

- d) Lack of financial support to provide relevant facilities, such as computer lab and learning materials in CAT, etc()
Your solution: _____

- e) Learners don't have computers at home to practice on.....()
Your solution: _____

- f) Overcrowded classrooms()
Your solution: _____

- g) Learners use the computer for entertainment instead of academic matters ()
Your solution: _____

- h) Administrative problems, such as time-tabling()
Your solution: _____

- i) Time constraints on the teachers' side ()
Your solution: _____

16. Are there any other problems that you encountered? Please specify and propose solutions to the problems.

APPENDICE B

Dear Respondent

The **Questionnaire** is for academic purposes, namely to obtain an M. Ed: Educational Management **at the CENTRAL UNIVERSITY OF TECHNOLOGY, FREE STATE.**

It is based on the project entitled:

“PROBLEMS ENCOUNTERED WITH THE TEACHING OF COMPUTER APPLICATIONS TECHNOLOGY AND INFORMATION TECHNOLOGY AT SENIOR SECONDARY SCHOOL LEVEL: A MANAGERIAL PERSPECTIVE”

The purpose of the questionnaire is to offer you an opportunity to raise problems you encountered in teaching Computer Application Technology (CAT) and/or Information Technology (IT). The questionnaire is a mere instrument to obtain information from the secondary school educators in **BLOEMFONTEIN, FREE STATE PROVINCE.**

Your responses are confidential and will not be identified by your name and/or your secondary school.

M. Ed student

Li Rijuan

PROBLEMS ENCOUNTERED WITH THE TEACHING OF COMPUTER APPLICATIONS TECHNOLOGY AND INFORMATION TECHNOLOGY AT SENIOR SECONDARY SCHOOL LEVEL: A MANAGERIAL PERSPECTIVE

This questionnaire is for **teachers teaching Information Technology (IT)** in the FET Band in the **Free State Province**.

Your responses will remain strictly **CONFIDENTIAL**. Your identity will remain **ANONYMOUS**, please **DO NOT** sign your name.

**QUESTIONNAIRE
SECTION A**

BIOGRAPHICAL DETAILS OF RESPONDENT

Please indicate your response by putting a cross [x] in the appropriate block

1. Your gender

- | | |
|-----------------|---|
| a) Male..... | 1 |
| b) Female | 2 |

2. Your current post level

- | | |
|----------------------------|---|
| a) Principal..... | 1 |
| b) Deputy Principal..... | 2 |
| c) Head of Department..... | 3 |
| d) Subject Head..... | 4 |
| e) Teacher | 5 |

3. Your present age

- | | |
|-----------------------------|---|
| a) 30 years or younger..... | 1 |
| b) 31 to 40 years..... | 2 |
| c) 41 to 50 years..... | 3 |
| d) Older than 50 years..... | 4 |

4. Your teaching experience in years

- | | |
|----------------------------|---|
| a) 0 to 5 years | 1 |
| b) 5 to 10 years..... | 2 |
| c) 11 to 20 years..... | 3 |
| d) 21 to 30 years..... | 4 |
| e) More than 30 years..... | 5 |

5. Your highest professional qualification

a) Teaching Diploma.....	1
b) Bachelor's Degree.....	2
c) Honours Degree.....	3
d) Master's Degree.....	4
e) Doctorate.....	5
f) Other (Specify).....	6

6. When and where did you obtain your highest qualification? (for example, 2002, UFS)?

7. In which type of school are you teaching?

a) Public School.....	1
b) State-Aided / Government Subsidised.....	2
c) Private School.....	3
d) Other, specify.....	4

SECTION B

The questions in this section pertain to IT related training. Please answer the questions as honestly as possible.

8. Did you receive training in IT?

a) YES.....	1
b) NO.....	2

If your answer to question 8 is YES, answer Question 9

9. From which type of institution did you receive training in IT?

a) Officials from the DoE.....	1
b) Representatives from Non-Government Organisations (NGO'S)	2
c) Educators from a Higher Education Institution.....	3
d) Private training institutions	4
e) Other (please specify).....	5

10. What was the duration of the training for IT?

- | | |
|-------------------------------|---|
| a) One day to one week | 1 |
| b) One week to one month..... | 2 |
| c) Up to a year | 3 |
| d) Two to four years | 4 |
| e) Other, specify | 5 |

11. Did you receive any training with respect to the teaching of IT to FET-learners (Didactical training)?

- | | |
|--------------|---|
| a) YES | 1 |
| b) NO | 2 |

If you answered YES to question 11, please answer question 12.

12. For which aspects of your teaching duties in IT did the content and/or didactical training that you received, not cater?

13. Would you like to receive more subject related training for IT?

- | | |
|--------------|---|
| a) YES | 1 |
| b) NO | 2 |

14. In which areas of the content of IT would you like to receive more training on?

15. The following are anticipated problems that affect educators as teachers of IT. Please indicate the one(s) that you encounter with an (x) and propose solutions to the problems.

- a) Lack of sufficient subject related training for teachers in IT())
Your solution: _____

- b) Lack of sufficient didactical training for teachers in IT())
Your solution: _____

- c) Not enough computers for learners.....()
Your solution: _____

- d) Lack of financial support to provide relevant facilities, such as computer lab and learning materials in IT, etc()
Your solution: _____

- e) Learners don't have computers at home to practice on.....()
Your solution: _____

- f) Overcrowded classrooms()
Your solution: _____

- g) Learners use the computer for entertainment instead of academic matters..... ()
Your solution: _____

- h) Administrative problems, such as time-tabling()
Your solution: _____

- i) Time constraints on the teachers' side()
Your solution: _____

16. Are there any other problems that you encountered? Please specify and propose solutions to the problems.

GLOSSARY

Computer Applications Technology

Computer Applications Technology is the effective use of information and communication technologies in an end-user computer applications environment in different sectors of society (DoE, 2003:27).

Further Education and Training (FET) Band

The FET band consists of all learning and training programmes from NQF Levels 2 to 4, or the equivalent of Grades 10 to 12 in the school system. It is the band within the NQF which follows directly on the General Education and Training band and precedes Higher Education (http://www.polity.org.za/html/govdocs/green_papers/furtheredgp1.html)

Information Technology

Information Technology focuses on activities that deal with the solution of problems through logical thinking, information management and communication. It also focuses on the development of computer applications using current development tools. The subject develops awareness and an understanding of the social, economic and other implications of using computers (DoE, 2003:41).