“AN IMPACT ASSESSMENT ON IN-SERVICE TRAINING PROGRAMMES OFFERED TO COMPUTER APPLICATION TECHNOLOGY EDUCATORS IN SECONDARY SCHOOLS IN THE FREE STATE PROVINCE”

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DECLARATION

I, Keabetswe Jennifer Bihi (8106300298087) hereby declare that “An impact assessment on in-service training programmes offered to Computer Application Technology educators in Secondary Schools in the Free State Province” is my own work and that all sources I have used been indicated and acknowledged by means of complete references.

Signed by ---------- on the ---------- day of ----------2014.

DEDICATION

This work is dedicated to my late parents Thandiwe and Lekula Bihi for providing me with education and love. To my brothers Tumelo and Thabo Bihi for giving me their support through the duration of my study; and to my son Kananelo Bihi.

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ABSTRACT

It is generally believed that Information Communication Technologies can extend knowledge and education to poor and marginalised people in South Africa. However, African countries still face many challenges in trying to provide appropriate and sustainable solutions for improving education and skills that will support the development of educators in all communities; this can be viewed in light of the millennium developmental goal. Thus the Department of Education put measures in place to bridge the gap in knowledge, skills and understanding of Computer Application Technology (CAT) educators through the provision of in-service training (INSET) programmes.

The research study aimed at assessing the impact of in-service training programmes offered to CAT educators in Secondary Schools in the Free State province. The study made use of a survey and an evaluation research design. The target population for this study was all Further Education and Training (FET) Phase educators in all secondary schools in the Free State Province. A self-constructed questionnaire was used to collect both qualitative and quantitative data.

The study revealed that the INSET programme still needs to improve on its content relevance to syllabus and it should provide educators with skills in dealing with the challenge of teaching learners with disabilities. The majority of educators were satisfied with the INSET programme as they indicated that it assisted in enhancing their skills and content knowledge; they further indicated that it gave them motivation to go into classrooms and teach. One educator quoted “I am now able to make some functions that usually gave me headaches. It greatly changed and developed the knowledge I had”. This indicates that the challenges that were experienced in classrooms were also met. It can thus be concluded that the INSET programmes did have a positive impact to the skills and challenges that educators experienced. That the study did achieve its

goal which was to assess the impact of INSET programs for CAT educators in the Motheo District, Free State province.

ACRONYMS A ND ABBREVIATIONS

CAT:	Computer Application Technology
CAPS:	Curriculum Assessment Policy Statement
DoE:	Department of Education
DoBE:	Department of Basic Education
FET:	Further Education and Training
FSDoE:	Free State Department of Education
GET:	General Education and Training
HE:	Higher Education
HET:	Higher Education and Training
HRD:	Human Resource Development
HEQC:	Higher Education Qualifications Criteria
HEQF:	Higher Education Qualifications Framework
ICT:	Information Communications Technologies
INSET:	In-service training
NCS:	National Curriculum Statement
NQF:	National Qualifications Framework
OECD:	Organisation for Economic Co-operation and Development
OBE:	Outcomes Based Education
PDoE:	Provincial Department of Education

SA: South Africa

SAQA: South African Qualifications Authority

UNESCO: United Nations Educational, Scientific and Cultural Organisation

WWW: World Wide Web

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CHAPTER ONE

AN OVERVIEW OF THE STUDY

1.1 INTRODUCTION

The National Curriculum Statement (NCS), and recently, the newly introduced Curriculum Assessment and Policy Statement (CAPS), visualise educators who are qualified, competent, dedicated, caring, and have the ability to fulfil the various roles, which included being mediators of learning, interpreters and designers of learning programmes and materials, leaders, administrators and manager, scholars, researchers and lifelong learners, community members, citizens and pastors, assessors and subject specialists (Parker; 2011: 2). These are the seven most important roles set by the Department of Education (DoE); these endeavours cannot be met if the DoE does not focus on its employees in the system that are regarded as the key to effect improvement of the quality in schools. Thus the intervention of INSET programmes was implemented by the DoE to enhance the content knowledge of educators in Computer Application Technology (CAT[1]) in order to ensure they meet the requirements of CAPS.

This chapter provides a background to the study, followed by the significance of this study, and an explanation on the needs and importance of in-service training (INSET) and its definition and aims. The problem of the study is also stated, which leads to the research questions that the study intends to answer.

1.2 BACKGROUND OF THE STUDY

Munonde (2007: 28) states that, in order to meet challenges brought about by socio-political changes, South Africa has to provide quality education for its people. It is in this regard that schools were envisaged as the providers of quality education and as contributors to national progress and socio-economic issues. One of the challenges, which needed to be addressed, was the issue of computers, as it was one of the

[1] In some instances of this study, CAT will be presented as Information Communication Technology (ICT), as it is learning directed to the development of ICT skill (Maholwana-Sotashe; 2007: 50).

fastest ways of developing the economy of a country, and it became one of the important tools to collect valuable information. However, computers need people who are computer literate; thus the need for CAT educators (Fambaza; 2012: 1). It is for this reason that the National Planning Commission (2011:3) did indeed prioritise education as the means to ensure the achievement of the employment targets of educators, as well as addressing the skills shortage that this country is experiencing.

1.2.1 Curriculum changes and computer application technology

Changes in the curriculum delivery impacted seriously on the training afforded to CAT educators with regard to the implementation of the NCS, and recently, the newly introduced CAPS. However, Munonde (2007: 31) emphasises that “the nature and extent of policy-making for initial and continuing professional educator development varied from country to country”. All educators are key contributors to the transformation of education in South Africa. Therefore, the researcher sought to undertake an assessment on the training provided to educators towards improving the quality of teaching and learning in CAT at secondary schools of the Motheo district, Free State Province.

1.2.2 DEFINITION AND AIMS OF IN-SERVICE TRAINING (INSET) PROGRAMME

The aim of INSET is to improve the quality of education through the development of educators. In this study, the focus of INSET will be on CAT educators and their development.

INSET is defined as all forms of continuing education and training for educators, whether formal or non-formal, accredited or non-accredited, and professional or for professional purposes (Ravhudzulo; 2001: 18). It also caters for the professional growth of educators because the initial training gained by educators cannot equip them to cope with complex, demanding and changing needs of education (Ranjini; 2003: 11).

The ultimate aim of INSET is to widen and deepen educator's knowledge, understanding and expertise with respect to their professional work by means of activities to attain this purpose and by implication to have a positive impact on teaching and learning in the classroom (Mofokeng; 2003: 15).

1.3 NEEDS AND IMPORTANCE OF IN-SERVICE TRAINING PROGRAMME FOR EDUCATOR EDUCATION

INSET is any vocational training acquired during employment, and an undertaking to engage in such training is usually part of the appointment agreement between employer and employee. In the current situation in South African education, training is necessary to re-orientate educators to new goals and values, to prepare them to cope with curriculum changes, to train them in new teaching and learning method, and to provide them with the knowledge and skills to teach new learning areas (Conco; 2004: 04). INSET also assists newly qualified educators, as they are frequently criticised for being under-prepared in the content knowledge of the subjects/learning areas they teach. Perhaps the set standard that they should maintain of learner-centred education has contributed to the under-emphasis on content knowledge, and the ability to make it accessible to learners. Nonetheless, whatever the reason, it is clear that no one can teach something they themselves do not know, and a re-emphasis on the key importance of content knowledge is needed at this time. Learner centeredness means that the learners are active participants in the learning process (Pillay; 2002: 222). The content knowledge that is needed by educators to improve their teaching can only be acquired through the attendance of INSET programmes.

1.4 SIGNIFICANCE OF THE STUDY

The study emanates from the premise of the Teacher Development Summit (2009), which was to facilitate effective system-wide educator development that would lead to sustainable improvement in the quality of teaching and learning in school classrooms.

The evaluation was undertaken against a background and context of economic empowerment opportunities that emerged with the post-1994 democratic order in

South Africa. The imperative to transform South African society stems from the need to address the imbalances of the past, specifically in the field of CAT (Department of Education; 2008: 9). The importance of this study was to assess the skills development programmes offered to CAT educators. This will then assist in the improvement of quality education, and ensure that educators benefit, to their fullest potential, from training programmes offered to them.

1.5 STATEMENT OF THE PROBLEM

The NCS required that the knowledge and skill levels of educators be diverse, to deal with the vastly refined and more thought-provoking curriculum matters. Despite the history of achieving marginal benefits from using technology in education, many schools were investing heavily in CAT (Prince; 2007: 8). In some schools, the DoE was of the view that by encouraging more learners to enrol for CAT will results in a change in society for the better, as they will have employment opportunities (Prince; 2007: 8). While the DoE was on the drive to increase the enrolment rate in CAT, it was also important to take stock of the competence level of the educators tasked with the responsibility of teaching CAT. The majority of the educators were trained prior 2005; therefore, while introducing the curriculum reform, the DoE, in most cases, followed the route of educator development programmes in the form of INSET. They did this by aligning their training with the educator development framework, which stated that all educators needed to enhance their skills, not necessarily their qualifications, for the delivery of the new curriculum. A large majority need to strengthen their (CAT) subject knowledge base, pedagogical content knowledge and teaching skills (DoE; 2007: 16). In the Free State Province, educators would attend this programme during the school vacation or on weekend block sessions. These programmes were subject/content related for a particular grade, where the emphasis was on the content mastery.

Conco (2004: 3) states that at the centre of any successful school improvement plan or reform initiatives are the people who translate goals into reality. In a school, educators are the key implementers of new programmes and practice that impact on learning. Although a well-crafted mission statement, specific improvement goals, milestones and a timeline are important, a school improvement plan must include a

strategy to address educator development. He further states that educators will not naturally acclimatise to a new set of goals and expectations; nor should they be left to “speed up” on their own, thus a proactive approach to educator development is required. Therefore, the researcher felt there was the need to assess the impact of CAT INSET programmes, offered to the CAT educators, on the quality of teaching in CAT lessons.

On the basis of the situation set out above, the research seeks to assess the impact of INSET programme that is offered to CAT educators by the Free State Department of Education.

The next aspect of the study focused on the research questions resulting from the main research question.

1.6 RESEARCH QUESTIONS

The main research question for this study is:

What is the impact of INSET programme offered to CAT educators in secondary schools in the Free State?

In order to answer this question the following subsidiary questions were formulated:

- What were the challenges experienced by educators in implementing CAT in classrooms after participating in the INSET training programme?
- What are the skills that educators lack in order to improve the teaching of CAT after participating in the INSET training programme?

1.7 RESEARCH AIMS AND OBJECTIVES

The main aim of this study was to assess the impact of training programmes offered to CAT educators on the quality of teaching and learning in CAT classrooms in secondary schools in the Free State Province. In order to accomplish this, the following research objectives are aimed to be realised by the study:

- To assist educators to adapt to the new curriculum needs
- To provide educators with continuous skills to improve teaching and to be effective leaders of CAT in secondary schools in the Free State Province.

1.8 ASSUMPTIONS

In conducting the study the researcher assumed that INSET programmes assists CAT educators to adapt to new curriculum changes and it provides them with continuous skills in order to improve their teaching.

1.9. DEFINITIONS OF OPERATIONAL TERMS

To facilitate the ease of understanding the terminologies used in this study the researcher felt the need to define the following concepts:

1.9.1 Impact assessment

Impact refers to the changes that activities bring about, and the effect of the intervention on the target area and group. It is the end point of an intervention; involving input, process, output and outcome (Balanskat, Blamire & Kefala; 2006: 24). Balanskat *et al.* (2007: 6) further state that impact is the overall achievement on the educational system, and can be described by a variety of qualitative indicators such as improvements in natural test results, or improved learning in schools, depending on the policy target. The International association for impact assessment (2009:1) defines impact assessment as a process of identifying the future consequences of a current or proposed action. From the two definitions set out above, it is deduced that for the purposes of this study, impact assessment is the impact of developmental activities derived from INSET programmes, whereby at the end of the training an assessment is made on the implications of the training

1.9.2. Assessment

The process of collecting evidence and making judgements relating to outcomes, such as achievement of particular goals of educators and other's understandings (Harlen; 2007: 12). Chappuis, Stiggins, Arter and Chappuis (2004: 11) concur with Harlen by stating that assessment refers to all those activities undertaken by educators that provide information to be used as feedback to modify teaching activities.

1.9.3 Computer applications technology (CAT)

According to the Department of Education (2011:07), CAT is the study of the integrated components of a computer system (such as hardware, software and software applications) and the practical techniques for the efficient use and application to solve everyday life problems. CAT is a learning area in which the educators teaching it are supposed to be equipped with the skills of mastering its content through the attendance of INSET programmes. In some instances of this study, CAT will be presented as Information Communication Technology (ICT), as it is learning directed to the development of ICT skill (Maholwana-Sotashe; 2007: 50).

1.9.4 Quality

Is defined as the totality of the features or state of the products and/or services that satisfies the stated and implied need of the customer (Mukherjee; 2006: 32). For this study quality in INSET is defined as a programme that caters to the in-service education needs of educators and which is good is good in quality in the sense that it considers all pertinent professional and personal factors while they are designed and executed (Siddiqui; 2008: 123).

1.9.5 In-service training (INSET)

INSET is defined as training that takes place while one is employed. It is a significant stage of the continuum of educator education as a whole; however, not fully related to the development of the professional career only, but also to the development of the school, its policy and society in general (Lazarovậ & Prokopovậ; 2004: 01). On

the other hand, Mathekga (2004: 10) defines INSET as, “continuous professional development of teaching practitioners”. This definition links up with the training done outside the classroom in the form of seminars and workshops. Educators are developed and capacitated during these workshops (Conco; 2005: 17).

1.9.6 Learning area

A learning area is a field of knowledge, skills and values, which has a unique feature as well as connections with other fields of knowledge and learning areas (DoE; 2008: 9). The learning area referred to in this study is CAT, which is offered from grade 10 to 12.

1.10 LIMITATIONS OF THE STUDY

In order to ensure that the research is of a manageable size, it is necessary to demarcate the research area. Limiting the research area does not imply that the research is not needed in other provinces (Selesho; 2008: 21).

This study will be delimited to secondary schools in the Motheo District and the researcher will only make use of a questionnaire to collect data.

1.11 ORGANISATION OF THE REMAINDER OF THE STUDY

This study contains five chapters, which will be briefly explained below:

Chapter 1: Introduction: The first chapter familiarises the reader with the research questions, aims and objectives of the study.

Chapter 2: Literature review: This chapter will focus on comparative studies and research conducted by other researchers in similar fields of study, written articles, books and newsletters published by the Department of Education.

Chapter 3: Research design: This chapter will provide a detailed research design, research questions, target population, research instruments, the data collection procedures and analysis.

Chapter 4: Research findings: This chapter will give an outline of the major sections contained in the chapter.

Chapter 5: Summary, conclusion and recommendations: The researcher will give a summary of the whole study, starting with the research problem, followed by major subjects of the review of literature, and research methodology, and will conclude with major findings.

1.12 SUMMARY

The focus of this study was to assess the impact of INSET programmes offered to computer application technology educators in secondary schools in the Free State Province. The second chapter focuses on the literature review. Information gathered in this chapter stems from the two research questions, which the researcher intended to investigate.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The previous chapter (Chapter 1) presented the reader with the research questions, aims and objectives of the study. Therefore, in this chapter literature is going to be reviewed regarding INSET programmes offered to CAT educators.

The chapter is firstly going to introduce literature on INSET and educator's development, then the education system, which is going to indicate the place of CAT in the educational bands and educator education in South Africa, as well as the teaching of CAT. These will be followed by two objectives, the first objective is to identify challenges experienced by CAT educators in the facilitation of CAT in their classrooms, and the second objective is to identify skills required by CAT educators in order to improve teaching of CAT in their classrooms. It is envisaged that these objectives will indeed assist the researcher in tracing the expectations of educators as well as the INSET training provided and its impact. Relevant literature will also be explored to support the objectives set. The chapter will also provide a conceptual framework to outline literature that was followed in addressing the research problem.

2.2 THE EDUCATION SYSTEM IN SOUTH AFRICA

The South African Qualifications Authority Act (58 of 1995) established the National Qualifications Framework (NQF) upon which national standards and qualifications need to be registered, and the SAQA brief is to oversee this process. The need to create a qualification framework was not uniquely a South African phenomenon, as such frameworks, which influenced the South African one, already existed in Australia, Canada, New Zealand and Scotland (Devroop; 2002:04). Thus, it can be deduced that South Africa is a country that aligns itself with International trends.

2.2.1 NQF levels

The South African NQF consists of eight levels, grouped into three bands of education:

- General education and training (GET), which runs from grades 0-9 and includes adult basic education and training (ABET) (Level 1).
- Further education and training (FET), which takes place from grade 10 to 12, and includes career-oriented education and training offered at FET institutions such as technical colleges, community colleges and private colleges (Level 2 to 4).
- Higher education and training (HET), which includes education for undergraduate and post-graduate degrees, certificates, and diplomas up to the level of the doctoral degree (Level 5 to 10). (Isaacs; 2007: 3).

Table 2.1 illustrates the different education bands and the interlink with the pre-school, primary, secondary and tertiary education.

Table 2.1 Educational bands and interlinks with pre-schooling, primary, secondary and tertiary education

NQF LEVEL	BAND	QUALIFICATION TYPE
Higher Education and Training		
10 9 8 7 6 5	Higher Education and Training (HET)	• Post-Doctoral Research degrees • Doctorates • Masters Degrees • Professional Qualifications • Honors Degrees • National First degrees • Higher Diplomas • National Diplomas • National Certificates

<table>
<tr><td colspan="5">Further Education and Training</td></tr>
<tr><td>4

3

2</td><td>Further Education and Training (FET)</td><td>National Senior Certificates (comprising of the following subjects)
Accounting
Agricultural Management Practices
Agricultural Sciences
Agricultural Technology
Business Studies
Civil Technology
Computer Applications Technology
Consumer Studies</td><td>Dance Studies
Dramatic Arts
Economics
Electrical Technology
Engineering Graphics and Design
Geography
History
Hospitality studies
Information Technology
Languages</td><td>Life Orientation
Life Sciences
Mathematics
Mathematical Literacy
Mechanical Technology
Music
Physical Sciences
Religion Studies
Tourism
Visual Arts</td></tr>
<tr><td colspan="5">General Education and Training</td></tr>
<tr><td>1</td><td>General Education and Training (GET)</td><td colspan="3">Grade 9/ ABET Level 4 (Adult Basic Education and training levels 1-3)</td></tr>
</table>

		Foundation Phase (Grade R-3) Foundation Phase Specialisation Fields: • Literacy • Numeracy • Life Skills	**Intermediate Phase (Grade 4-6)** • Languages • Mathematics • Arts and Culture • Life Orientation • Natural Sciences and Technology • Social Sciences	**Senior Phase (Grade 7-9)** • Arts and Culture • Economic and Management Sciences • Languages • Life Orientation • Mathematics • Natural Sciences • Social Sciences • Technology

Table 2.1 provides a brief description as to where the computer application technology learning area is nested in the further education and training band. It also gives a brief description on the other education bands, namely the general education and training and the higher education bands. It is vital that the further education and training certificate (general) articulates with the general education and training certificate and with qualifications in similar learning pathways of higher education (DoE; 2011: 11).

2.3 TEACHING OF CAT AND THE LEARNING CONTENT

In CAT, content is embedded in the integration of end-user computer application programmes (DoE; 2011: 8). It is important that the subject has a generic approach; textbooks should not be considered as the only source of content, as they become outdated. Other relevant resources such as newspapers, magazines, journal articles, and radio and television reports should be incorporated into the content (DoE; 2008: 14). Making use of all these relevant resources requires that an educator has knowledge of the technique of using these resources in his/her classroom. According to Fambaza (2012: 13), there are many methods of teaching that can be used by

educators, ranging from educator-centered and subject-centered to learner-centered methods.

The teaching methods referred to in the previous paragraph are the demonstration method, the use of textbook method, the question and answer method, and the lecturing method. For this study, the drilling method is the most suitable method for teaching in a CAT classroom, as it addresses the aims of the curriculum set out in the CAPS document for CAT (DoE; 2011: 5). It involves drilling, practicing and the polishing of practical skills. It is suitable for the practice of subjects like CAT, where mostly, theory is put into practice by means of hardware and software. It is important for the educator to follow a logical sequence of knowledge that is relevant to learner experience. The educator should also consider the issue of inclusivity and diversity in the classroom when planning CAT teaching activities, like considering individual past experiences, learning style and preferences (DoE; 2008: 24).

The needs and importance for educators to attend INSET programmes has been discussed in Chapter 1 (Section 1.2.2). Every educational system in any known human society requires highly skilled teaching personnel to sustain it (Osunde & Omoruyi; 2004: 1).

2.4 IN-SERVICE TRAINING (INSET) AND EDUCATOR DEVELOPMENT

In recent years, the teaching quality of educators has been under increasing attack; hence, often training is organised for educators to upgrade and update their knowledge and skills. Given the poor quality of educator training in the past, and the magnitude of change in the education sector, issues of educator development continue to be critical focus areas. Thus, current regulations specify that educators must complete 80 hours of INSET per year (DoE; 2000:18). In order to improve this, the skills development plan was introduced with a mandate to improve the working skills of South Africans so that the economy can grow and all South Africans can live a better life. Educators also expressed a need for training in anti-bias issues, management of diversity, accommodating learners with special educational needs (LSEN), co-operative learning, lesson planning and a need for more practical training that is relevant to their environmental context (Mahomed; 2004: 3).

Like all other professions, CAT educators need to stay informed about new knowledge and technologies. Yet, many express dissatisfaction with the professional development opportunities made available to them in schools and insist that the most effective development programs they have experienced have been self-initiated (National Academies Press; 2007). Professional development is therefore a costly part of what governments, professions, companies and educators must do to efficiently respond to contingencies and build platforms for sustainable growth in reaction to continuous change. Desai, Qorro, & Brock-Utne (2010: 150) proposed that the core stages of educators learning are emerging, applying, infusing, and transforming. Emerging describes the state when educators explore the potential of technologies (computers), and applying means that educators are using computers for tasks such as word processing, creating databases, exploring content software, and accessing the Internet (Glen, Moss & Schwabb; 2005: 161). Infusing refers to an educator's exploration of new ways in which the portal can change and optimise professional practice, and the effectiveness and efficiency of teaching (Glen et al; 2005: 161). In the last stage, which is the transforming stage, schools use the ICT to rethink and renew school organisation in creative ways. ICT is taught as a separate subject at the professional level and is incorporated into all vocational areas (Wilson-Strydom, Thomson & Hodginkinson- Wilson; 2005: 2). Modifying a teaching style is a complex endeavour, where an educator may find that applying technology and infusing it into the classroom essentially requires the learning of new skills that, when mastered, enhance the engagement of, and learning by, the student.

The training of CAT educators is one of the most critical aspects that require thorough facilitation. According to Ochs (2011: 05), training has to be actively encouraged through on-going research in order to enhance the professionalism of educators and to address the on-going challenges of their devalued professional status. Training is not only essential for beginning educators, but also for experienced educators; this means that all educators need life-long and continuous training and retraining in order to improve their efficiency and performance. (Davis; 2008: 271). Davis (2008: 272) further states that every university attempts to develop new educators with modern knowledge, and prepared with new technology, science and methods, by providing effective and fruitful training in-service courses.

2.5 SKILLS REQUIRED BY EDUCATORS IN ORDER TO IMPROVE TEACHING AND LEARNING OF COMPUTER APPLICATION TECHNOLOGY

To address one of the objectives of the study the researcher is going to present the reader with relevant literature regarding the skills required by educators, which will be discussed below:

2.5.1 Reflection of the National Curriculum Statement

Changing the school curriculum was a high priority for post-apartheid South Africa, which recognised the need for a single national qualification framework that would bring together those aspects of our culture which are too important to be left to chance (OECD; 2003: 96). The 1995 White Paper on education and training (DoE; 1995:2) promoted a vision of a prosperous, truly united, democratic and internationally competitive country with literate, creative and critical citizens, leading productive, self-fulfilled lives in a country free of violence, discrimination and prejudice. It has been this vision that has driven curriculum reform.

According to OECD (2008: 169), the introduction of the National Curriculum Statement (NCS) has not been unproblematic. Its critics addressed its political and epistemological base and its instrumentalist approach, and especially its complexity, language, lack of alignment and inadequate implementation support (OECD; 2008: 170). In addition, the adoption of outcomes based education (OBE) was seen as an example of international policy borrowing, with its roots in competency debates (Steiner-Khamsi & Stolpe; 2006: 134). However, it has become increasingly clear that South Africa's national version of OBE has been given local content and meaning by having its own roots in human rights, social justice, equity and action building. In this sense,

> "South Africa's curriculum is simultaneously borrowed and inflected with difference" (Chisholm, 2005: 96).

This means it has been adjusted according to the needs of South Africans. The review committee on Curriculum 2005 (which included both defenders and critics) argued in its report that OBE itself was not the issue, but that the design of the

curriculum and aspects associated with its implementation were, *inter alia* the educator training, learning support materials, provincial support and time frames (OECD; 2008: 170). It also argues that while there was overwhelming support for the principles of OBE and for Curriculum 2005 with their strong focus on results and successful learning, inadequate resourcing and insufficient regard for local realities hampered implementation (Chisholm; 2003: 4). Educators had their reasons for not using computers effectively in their classroom. Some of the reasons were, they had fear of losing control of their classroom, they had fear of computer and they were not willing to spend extra time to learn new systems (Desai; 2008: 79).

Similarly, the South African Department of Education argued that there is a need to

> bridge the gap between the varied information needs and skills to access the curriculum to ensure effective use of the skills and the development of the literacies. It is essential for the implementation of resources based learning and development of lifelong learning broadly categorized as information literacy and digital literacy (DoE; 2003).

Educators are central to the implementation of the NCS. The challenges for educator development in ICT are to provide educators with the necessary knowledge, skills and understanding to integrate ICT successfully into educational practices in a meaningful way. The White Paper on e-Education (2003) views ICT development as a process that takes educators and learners through learning about ICT, learning with ICT, and learning through the use of ICT. However, educator development should maintain a balance between developing effective teaching and learning strategies, and increasing the knowledge and skills of educators in the use of ICT. Bingimlas (2009: 255) is of the view that new technologies have the potential to support education across the curriculum, and provide opportunities for effective communication between educators and learners in ways that have not been possible before. ICT in education has the potential to be influential in bringing about changes in ways of teaching. However, this potential may not be realised easily (Bingimlas; 2009: 235).

The training of educators and trainers is a crucial issue in modern societies. The world is changing very quickly and new sets of skills are needed daily (Grant Agreement; 2007). Jackson (2007: 10) states that the training theory suggests that educators must have control over their learning experience and environment. He further states that training theory consists of three levels of evaluation of the effectiveness of a training event, namely what the participant says about the value of the training, whether the participant demonstrably met the course objectives by acquiring some skill, and whether the skill acquired in training is implemented in the workplace (Jackson; 2007: 10).

2.5.2 The future of ICT in in-service for CAT educators

ICT has taken deep roots in school education at all levels throughout the country. The demand for educators who can teach ICT as a discipline is growing rapidly, specifically educators who can integrate ICT seamlessly into the teaching of various school subjects. This, in turn, has fuelled the need for well-trained educators, both in-service and pre-service, thereby ensuring a bright future for ICT in educator education. Educators need to have an understanding that computers need to be part of daily classroom activities to make technology transparent. Moreover, Morehead and LaBeau (2005: 03) believe that educators should not have learners involved with technology for technology's sake only.

2.5.3 CAT educator training programme

Training is referred to as an organised procedure by which people learn and acquire knowledge and skills for a definite purpose. It is a process of increasing human efficiency, whereby people are offered the opportunity to acquire new skills, and the current knowledge required to carry out various specialised tasks in their place of work. When people are offered training, they acquire new and improved skills and knowledge that will enable them to perform better, thereby enhancing their level of productivity. Training and re-training of educators, therefore, can enhance their level of performance and also enable them to cope with the ever-changing challenges of educating the mass of people (Osunde & Omoruyi; 2004: 406).

Khoza (2008: 13) observes that many computers related programmes are run to equip educators with necessary skills for the 21st century. For example, Microsoft South Africa runs an educators skills training programme that encourages educators to plough back the skills they gained from the course into their daily teaching practice (DoE; 2003). Researchers claim that the ends of education and training are achieved when transfer occurs. Furthermore, Khoza (2008: 13) indicated that School Net South Africa, in partnership with education, public, private and community donors, are trying to implement ICT in the education sector successfully. Furthermore, Intel® Teach to the future is a worldwide educator-training programme that aims to utilise ICT to support educational transformation.

Intel® Teach to the Future programme aims to help educators integrate technology into their classrooms in order to enhance student learning. Originally launched in the United States and now used in 33 countries worldwide, Intel® Teach to the Future is characterised by its emphasis on pedagogy, a commitment captured by Intel President, Dr. Craig Barrett's comment that, "computers aren't magic, educators are" (Barrett; 2000). The South African programme was launched in 2003. The goal of the Intel® Teach to the Future programme in South Africa is articulated as follows:

> To train classroom educators how to promote project-based learning and effectively integrate the use of computers into Curriculum 2005 and Revised National Curriculum Statements so that learners will increase their learning achievement (Wilson-Strydom, Thomson and Hodgkinson: 2005: 75).

The Intel® Innovation in Education Teach to the Future programmes embarked on a mission to assist educators with integration and the teaching and learning of ICT in their classrooms.

2.5.4 Twenty basic technology skills that all educators should acquire in the training programmes regarding their teaching of CAT

As skills are developed gradually (Kutzhanova; 2007: 45), INSET programmes should ensure that educators are provided with training on the skills that are relevant to their teaching in classrooms. Table 2.2 lists information regarding these skills that CAT educators should have. The skills in table 2.2 also concur with the skills mentioned in the CAPS document (DoE; 2011:15) that educators should cover in their content. Kutzhanova (2007: 50) defines a skill as a combination of ability, knowledge and experience that enables a person to do something well. According to Turner (2005: 1),

> 'Education has moved at light speed in the area of educational technology. Whether you are involved in secondary education, elementary education, or special education all of us find it difficult to catch up, keep up, and put up with fast-moving computer-based technology. As the computer and associated continue to change and evolve, educators must continue to strive for excellence in their work'.

This implies continued time and effort by educators to maintain and improve their technology skills.

Table 2.2 provides the basic skills, with an explanation of each skill, that every CAT educator should have in order to teach the subject effectively and efficiently.

Table 2.2: Twenty basic skills every CAT educator should have

	Skills	Description
1	Word processing skills	The word processing skill is defined as operating basic word processing programmes and their features for different types of products. The main function of a word processor, however, is the ability to allow one to type in and manipulate text (Jacobs, Gibson, Labuschagne, MacMillan, Miller, Noomé, Stoffberg & Wassermann; 2008: 107). Educators should be able to use this type of skill in order to complete written tasks in a timely manner.

2	Spreadsheet skills	Educators should be able to use some type of spreadsheet programme to compile grades and chart data. This skill includes knowledge of many basic techniques such as storing, processing and representing data within a spreadsheet (Abramovich, Nikitima & Romanenko; 2010: 2).
3	Database skills	Educators should be able to use some type of database programme to create tables, store and retrieve data, and query data.
4	Electronic presentation skills	Educators should be able to use electronic presentation software to create and give electronic presentations.
5	World Wide Web navigation skills	Educators should be able to navigate the World Wide Web (WWW) and search effectively for data on the Internet. WWW is a virtual space for information. Bastable (2006: 387) further elaborates that there are more than one billion web pages covering a wide range of topics, displaying a variety of formats including text, audio, graphics and in some cases, video, which will provide educators with more than enough material and information to use effectively in the CAT learning area.
6	Website design skills	Educators should be able to design, create, and maintain a faculty/educator Web page/site.
7	E-mail management skills	Educators should be able to use e-mail to communicate and be able to send attachments and create e-mail folders.
8	Digital camera knowledge	Educators should know how to operate a digital camera and understand how digital imagery can be used.
9	Network knowledge applicable to your organisation	Educators should know the basics of computer networks and understand how their school network works.
10	File management and Windows Explorer skills	All educators should be able to manage their computer files and be able to complete the following tasks: create, and delete files and folders, move and copy files and folders using the My Computer window and Windows Explorer.
11	Downloading software from the Web knowledge - including e-books	All educators should be able to download software from the Web and know the major sites that can be used for this purpose.
12	Installing computer software onto a computer system	Educators should be able to install computer software onto a computer system.
13	Web-CT or Blackboard teaching skills	Educators should be aware of these two online teaching skills and know how to use them to teach or take classes.
14	Video conferencing skills	Educators should be able to use a video conferencing classroom and understand the basics of teaching with video conferencing.
15	Computer-related storage device knowledge	Educators should understand and know how to use the following data storage devices: disks, CDs, USB drives,

		zip disks and DVDs.
16	Scanner knowledge	Educators should know how to use a scanner and what OCR capacity is.
17	PDA knowledge	Educators should now what a PDA is and how to use one.
18	Deep Web knowledge	Educators should know what the deep Web is and how to use it as a resource tool.
19	Educational copyright knowledge	Educators should understand the copyright issues related to education, including multimedia and Web-based copyright issues.
20	Computer security knowledge	Educators should know about basic computer security issues related to education.

Adapted from Chaćo (2009: 68).

2.5.5 Factors that influence educators' ICT knowledge, skills, values and attitudes

- **Age**

A study carried out by Cavas *et al* (2009: 20) determined that educator age was related significantly to educator attitude, and he reported the age of 36 as a breaking point to positive attitude. However, there are good reasons to believe that, in comparison to younger adults, older adults (over 40 years of age) may be disadvantaged to changes (Westerman & Davies; 2000: 478). They further state that the rapid growth in the use of information technology over the past two decades has led to a substantial cohort of differences in exposure. Generally, young people have been provided with a greater opportunity and incentive to develop information technology skills than have their older counterparts (Westerman & Davies; 2000: 479). In contrast, often training for older adults is provided on a 'need to know' basis.

- **Age and the performance of computer-based tasks**

Westerman and Davies (2000: 479) state that computer novices have found adults to be slower, relative to younger adults, in their acquisition and performance of information technology skills. Older adults take longer to complete training for word-

processing tasks and perform comparatively more slowly, following equivalent amounts of training on tasks involving word processing, the use of multi-function applications, for example notepad, calendars and information retrieval. Hedge and Borman (2012: 457) concur with the statement by indicating that the cognitive abilities such as memory and reasoning, which are important to the performance of computer-based tasks, decline with age. The information that is available here suggests that older people may have more difficulty than younger people may in computer-based tasks.

- **Computer use at home and at work**

Tella and Adu, (2009: 5) emphasise that computer access in classrooms is important for the successful implementation of computers for teaching purposes. The accessibility and availability of computers were important factors affecting the use of computers for instructional purpose (Cavas; 2009: 28). Educators with personal computers tended to concentrate on improving the quality of current practice through better preparation and student testing, rather than introducing major paradigmatic changes to their teaching (Cavas; 2009: 28). Using computers at home enables educators to be more efficient in preparing for their classes and assists them in customising their teaching materials and methods according to the individual student's needs (UNESCO; 2013: 18).

- **Experience**

Experienced educators play an important role in educating future educators, since they should suggest approaches for using ICT in actual classroom situations and should support future educators' experiences with learning activities that make use of ICT. Experienced educators supervising the practical education of future educators generally believe in the importance of integrating ICT (Bansal; 2009: 75).

2.6 CHALLENGES EXPERIENCED BY EDUCATORS IN IMPLEMENTING COMPUTER APPLICATION TECHNOLOGY IN CLASSROOMS

CAT is without doubt one of the most difficult subjects to administer and manage. This is true because educational planners, administrators and the government have been putting measures in place, *inter alia* the National Development Plan, which states that educators are critical for implementing the curriculum. In many ways the future reconstruction and development of the country depends on their capabilities, dedication, commitment and well-being towards schools (Makgoe; 2012: 01). INSET programmes were also put in place to assist in managing challenges, which might be experienced by educators teaching this subject. These challenges will be discussed individually through the literature to follow:

2.6.1 School level barriers

The following school level barriers are discussed, lack of time, lack of effective training, the quality of physical infrastructure, and the model of INSET in South Africa (SA**).**

2.6.1.1 Lack of time

Arokiasamy (2012: 23) indicated that many teaching staff had competence and confidence in using computers in the classroom, but they still make little use of computers because they do not have enough time. A significant number of sources identified time limitations and the difficulty in scheduling enough computer time for classes as a barrier to educators' use of computers in their teaching of CAT. The most common challenge by educators was lack of time to plan ICT lessons, explore different Internet sites, or look at various aspects of educational software (Bingimlas; 2009: 239). Oerman (2013: 39) refers to educators' time as a very precious resource in education. Many studies indicate that educators have adequate competence and confidence, but make little use of classroom technology due to lack of time. A substantial body of research identified time constraints as an important barrier to the use of ICT in teaching (Rodden; 2010: 15). The literature suggests that time

management is an issue that has to be considered and implemented by educators in order to successfully follow through on their teaching and meeting the objectives set by the school.

2.6.1.2 Lack of effective training

According to Bingimlas (2009: 239), the issue of training is certainly complex, because it is important to consider several components to ensure effectiveness of the training. These include time for training, pedagogical training and skills training. Bingimlas (2010: 73) further states that providing pedagogical training for educators rather than simply training them to use teaching resources for CAT is an important issue. However, besides the need for pedagogical training, it is still necessary to train CAT educators in specific skills. Inadequate or inappropriate training leads to educators being neither sufficiently prepared nor adequately confident to carry out full integration of teaching resources in the classroom. This indicates that for effective training to take place, educators should be consulted on the type of training that they actually require.

2.6.1.3 The quality of physical infrastructure

When faced with the challenge of introducing CAT in the educator's education curricula most institutions were unprepared, and most of the existing staff members very reluctant to take on additional responsibilities. Neither the infrastructure nor the human resources existed (Grown; 2009: 27). It has taken more than a decade to remedy this situation and build up some level of basic resources. This has affected the quality of educator education in the country severely, with major repercussions on the quality of education imparted in schools and colleges. One of the greatest challenges in ICT use in education is balancing educational goals with economic realities. ICTs in education programmes require large capital investments, and developing countries need to be prudent in making decisions about what models of teaching CAT use will be introduced, and to be conscious of maintaining economies of scale (Tinio; 2010: 1). According to the White Paper on e-Education these challenges can be summarised into three main areas:

- Participation in the information society
- Impact of ICTs on access, cost effectiveness and quality of education
- Integration of ICTs into the learning and teaching process (DoE; 2003: 8).

The DoE 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).

Tay and Lim (2013: 12) state that the physical and technological infrastructure of CAT is a fundamental condition for implementing changes to using computers in education. Setting up the necessary infrastructure requires consideration of the availability of physical infrastructure (example, rooms for servers, computer rooms, placing of cables and network points, and electricity supply points). It affects CAT diffusion, including electrical upgrades and building maintenance. Parachuting the CAT learning area into these environments without addressing underlying issues of organisational readiness, continuous professional development and infrastructure would be precipitous. A significant period is required to teach CAT, allowing for the development of technology plans, educators training and professional development (OECD; 2006: 78).

2.6.1.4 The model of INSET in South Africa

The South African National Department of Education has used the cascade approach since 1998 in its INSET and for its educator development (Dichaba; 2013: 265). In the cascade model, first national trainers at national level are trained. They are to provide training for district trainers, and then district trainers are to provide training for educators in each district. Figure 1 provides an overview on how this method works.

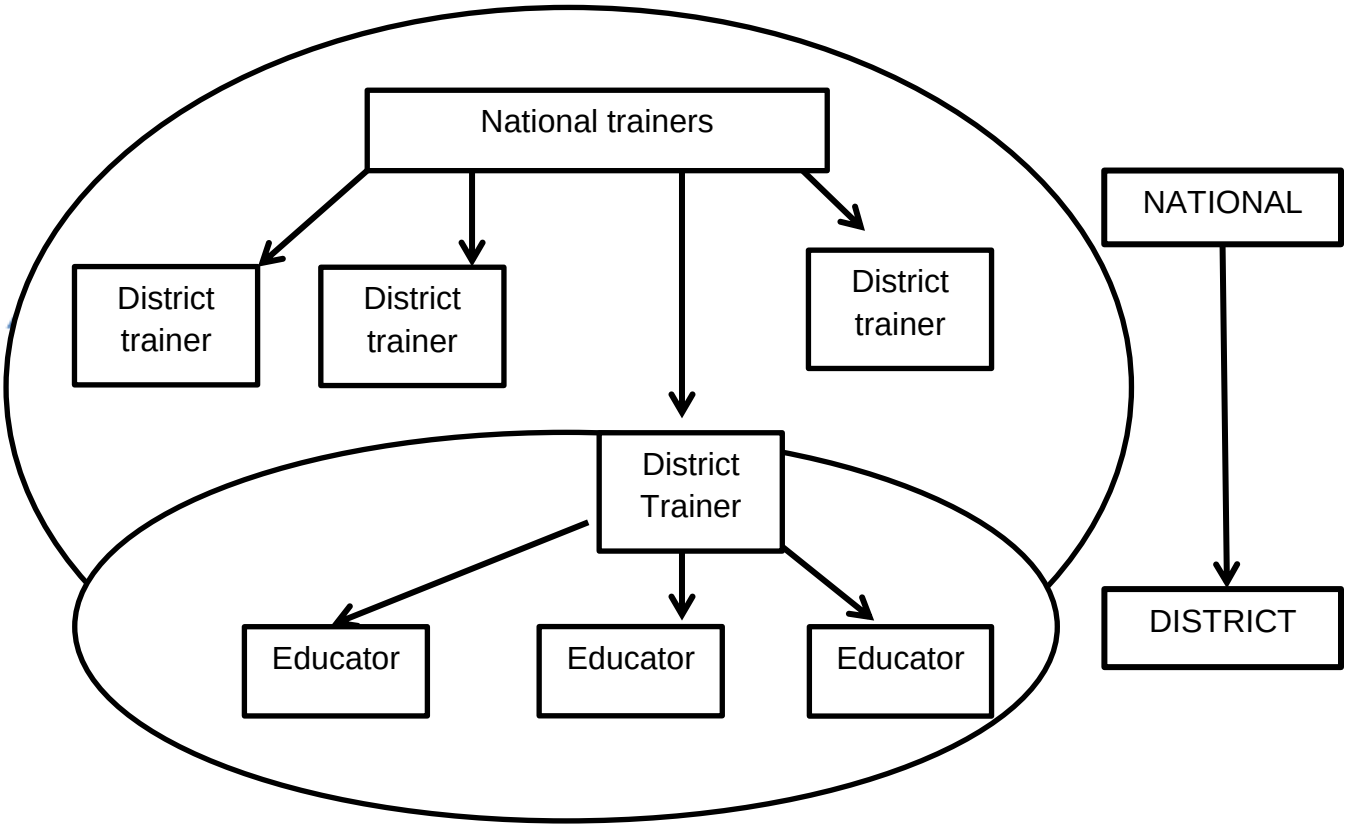

Figure 1: Cascade model for INSET (Dichaba; 2013: 03)

The use of the cascade model by the DoE in preparing CAT educators for implementation of the Curriculum 2005 has proved to be ineffective (Vital *et al*; 2005: 211).In this model officials of each province were trained as master trainers who would cascade the knowledge to district officials, who in turn would cascade the information to educators in the districts. Various problems were identified with this model, including the 'watering down' and/or misinterpretation of crucial information and the lack of confidence, knowledge and understanding of trainers (Chisholm; 2000:55). Despite the ineffectiveness of this model, it is still the dominant training model used in SA (Vital *et al*; 2005: 211). The advantage of this training model is that it allows training to take place in stages so that progress can be monitored. In addition, as more educators receive training, information can be disseminated quickly to an even larger number of educators (Dichaba & Mokhele; 2012: 250).

According to Conco (2005: 25), training fails in an organisation due to lack of a systematically developed training model. The organisation's overall objectives are

not clearly formulated, training programmes are not evaluated and the change in behaviour of educators' confidence in teaching their subjects is not observed (Conco; 2005: 34). Researchers state that the cascade model might not be the appropriate model for INSET, as trainers do not effectively disseminate information from top to bottom approach in their training sessions.

2.6.2 CAPACITY-BUILDING OF CAT EDUCATORS

For this study, capacity building is concerned with the educator's development, which is the process of equipping educators with understanding, skills and access to information, knowledge and training that enables them to perform effectively. It is also addressed in the Northern Province through the implementation of the development of an appraisal system, which has an instrument for assessing personal and professional needs of serving educators (Cheng, Chow & Tsui; 2001: 388). According to UNESCO (2006: 2) capacity development in education is important both for the functioning of the education system as well as for capacity building in other sectors.

Alvarez, Fernandez and Iglesias (2010: 6) define capacity building as the development of knowledge, skills and attitudes in individuals and groups of people relevant in the design, development and maintenance of operational infrastructure and processes that are locally meaningful. It is also referred to as the process by which individuals, groups, organisations, institutions and societies increase their abilities to perform core functions, solve problems, define and achieve objectives, and understand and deal with their development needs in a broad context and in a sustainable manner (UNESCO; 2006: 01).

Capacity building is also referred to as capacity development. It is the process where individuals, groups, organisations, institutions and societies increase their abilities to: (a) Perform core functions, solve problems, define and achieve objectives, and (b) Understand and deal with their development needs in a broad context and in a sustainable manner (UNESCO; 2006:01). For this study, capacity building is concerned with the human resource development (HRD). HRD is the process of equipping individuals with understanding, skills and access to information,

knowledge and training that enables them to perform effectively (UNESCO; 2006:02). Capacity building in education is important both for the functioning of the education system as well as for capacity building in other sectors.

2.6.3 NUMBER OF LEARNERS IN CAT CLASSROOM

The findings of Furlonger's study (Fambaza; 2012:42) indicate that all schools have to limit the numbers of learners who are doing CAT, and that educators reported that many learners want to do CAT due to their parents not having enough money to pay for tertiary education. Some further emphasised that this subject is going to enhance their employment prospects post-matric. This is an indication that when there are fewer learners in a CAT classroom, educators stand a better chance of managing them and empowering them with the content knowledge and skills needed. INSET should develop educators in managing learner numbers in CAT classrooms, in order for educators to avoid being overwhelmed by demands of assessing their learners (Burns; 2010:[online].

2.7 EDUCATOR LEVEL BARRIERS

2.7.1 Educator's feelings towards ICT programmes

Educators who reported negative or neutral attitude towards ICT into teaching and learning processes lacked knowledge and skills that would allow them to make "informed decisions" (Buabeng-Andoh; 2012: 139). Negative feelings exist mainly among educators who have been practicing within the classroom for more than a year. They might be stressed about the classroom structure if they were to integrate ICT into classrooms and if they are not confident, as they do not possess the skills necessary (Bingimlas; 2009: 238).

2.7.2 Educators morale and qualifications

Poor educator morale and qualifications, coupled with shortages of educational resources, hinder effective integration of ICTs and ultimately, student performance (OECD; 2006: 76). According to the World education forum (2000) there was a

decline in status of educators in recent years; this decline was due to material and non-material factors. It also became clear that the majority of educators believed that they did not receive the moral support and material recognition appropriate to their level of qualifications and responsibilities.

2.7.3 Integration of CAT in the classroom

Educators feel unprepared to integrate CAT in the classroom, and there are few opportunities for continuous learning for many time-pressured educators. Others are uncomfortable with investing instructional time to deal with possible equipment failures or slow internet access (Moeller & Reitzes; 2011: 7). Many educators lack the pedagogical, academic and class management skills to instruct low-achieving learners. Furthermore, there are widespread educator shortages where demand outstrips the supply of new educators from universities (OECD; 2006: 76). According to Flanagan and Jacobsen (2003: 124), “Integration is meant to be cross-curricular rather than become a separate course or topic in itself”. Mlambo (2007: 14) claims that there are three levels of integrating ICT into learning, namely functional practice, integrative practice and transformational practice. Hodgkinson-Williams (2006: 5) emphasises that when learners use the computer in basic or functional ways to do the things that the computer can do well, such as word processing, presentations, spreadsheets, graphs and searching for information on the internet, they engage in functional practice. By contrast, when learners use programmes to engage in activities that are more sophisticated, for example drafting and re-drafting a piece of writing, they claim that this constitutes integration practice. The third level of integration is characterised by learning, which occurs as a result of activities and opportunities which do not exist in a computer-less environment (Hodgkinson-Williams; 2006: 5).

The act of integrating ICT into teaching is a complex process and one may encounter a number of difficulties. These difficulties are known as barriers (Bingimlas; 2009: 237). A barrier is defined as, “any condition that makes it difficult to make progress or to achieve an objective” (Schoepp; 2005: 2). In Australian research, Bingimlas (2009: 237) found that many educators lacked the knowledge and skills to use computers and were not enthusiastic about the changes and

integration of supplementary learning associated with bringing computers into teaching practices. In developed countries like Japan and the United Kingdom, research reports that educators' lack of technological competence is a main barrier to their acceptance and adoption of CAT (Bingimlas; 2009: 237). Hence, the lack of educator competence may be one of the strongest barriers to the integration of technologies into education. It may also be one of the factors involved in resistance to change.

Even if the above problems are overcome, there is often a difficulty for educators who have had done training to be able to teach CAT because there are insufficient teaching resources in the school, or there is not enough time to review and plan lessons incorporating their use (Arokiasamy; 2012:22).

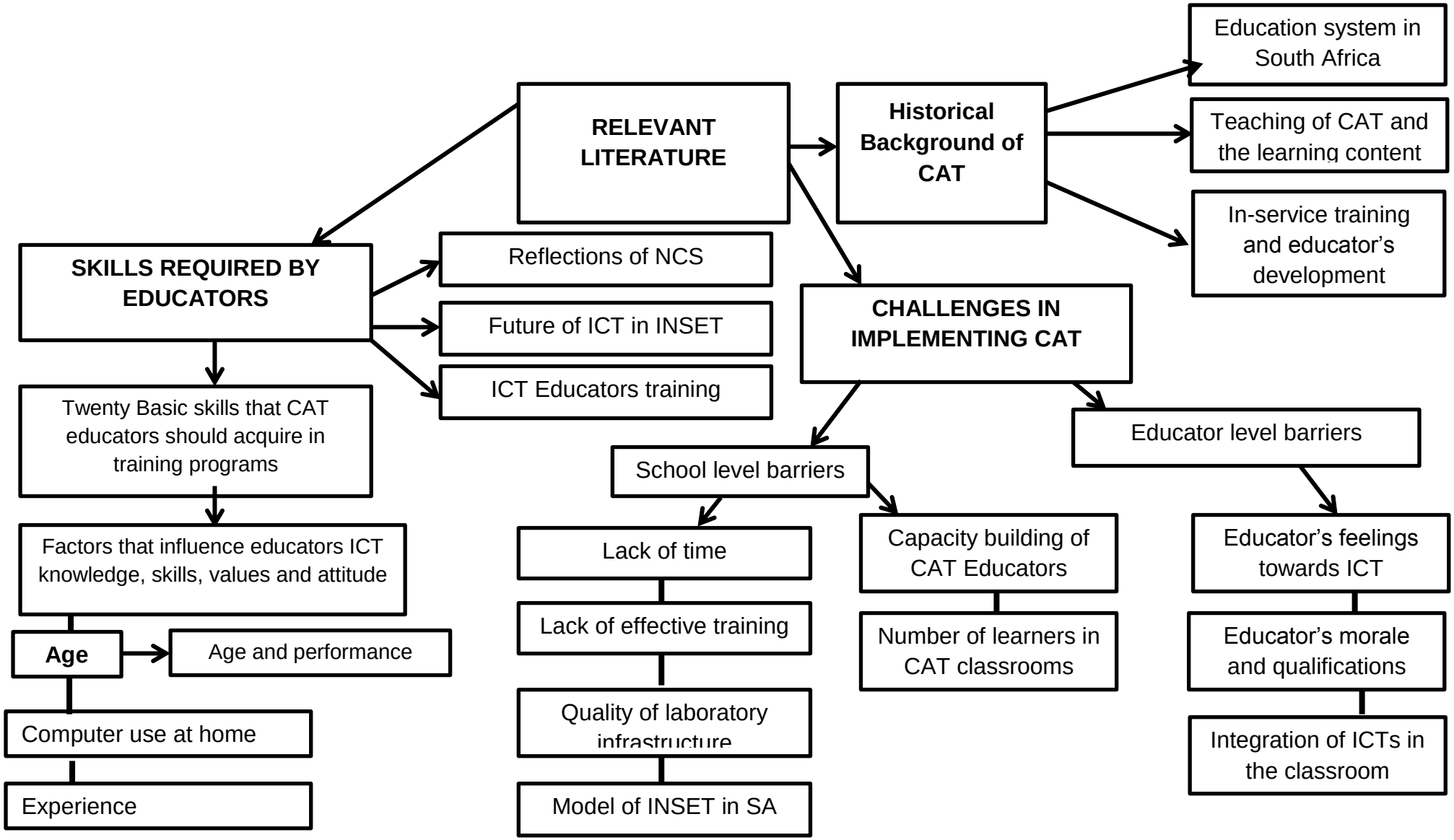

Figure 2: conceptual framework: impact assessment on inset programmes for cat educators

2.8 SUMMARY

In this chapter, the literature review focused on the impact of INSET programmes for CAT educators. The aim of INSET (Section 1.4) was very influential in this chapter. What clearly emerged in this chapter were the skills that educators should acquire through INSET, and the challenges that they still experience as educators and at school level. Although the literature was focused along the two research questions, it was imperative that it acquainted the reader with the historical background of CAT, and furthermore, put emphasis on the NCS, and the future of ICT and training of educators. The cascade model that has been used by South Africa was also highlighted; the literature revealed that this model might not be the best model, as information from the trainers to the trainees is often distorted and not correctly diffused. Lastly, the conceptual framework that presented literature that was reviewed in the chapter.

In Chapter 3, the study will focus on the research methodology and data collection instrumentation used.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The previous chapter reviewed the relevant literature on the education system of South Africa, revised NCS, CAPS, and the challenges faced by educators in implementing CAT, which resulted in the conclusion that the teaching of CAT, as well as the training of educators, remains challenging issues. This has resulted in continuous educator development taking place within the education fraternity, as narrated in the annual performance plan (Department of Basic Education; 2013: 42). This provided the basis for this study's document analysis and investigation into the research problem (Section 1.5), namely the impact assessment of the training programme offered to CAT educators in secondary schools in the Free State Province. The research questions, related to the aforementioned, were explored in this study (Section 1.6).

Furthermore, Chapter 3 explained the research approach and design methods used in this study to achieve the objectives (Section 1.6), the research paradigms, population, sample, and the data collection, analysis and reporting. Finally, this chapter concluded with issues of trustworthiness, validity and reliability, and ethical considerations.

3.2 RESEARCH AIMS OF THE STUDY

The aim of this study was to assess the impact of the training programmes offered to CAT educators in secondary schools in the Free State Province (Section 1.7).

In line with the above aim, the following objectives were set:

- To assist educators to adapt to the new curriculum needs
- To provide educators with continuous skills to improve teaching and to be effective leaders of CAT in secondary schools in the Free State Province.

3.3 RESEARCH APPROACH AND DESIGN

In the following section, the research approach and design are discussed based on the research questions in section 1.6.

3.3.1 Research approach

The research approach chosen for this study is both quantitative and qualitative research, better known as the mixed method approach.

The researcher used both the qualitative and quantitative research approaches for this study. The reason for using both approaches was that the survey method was used and the questionnaire that was constructed to gather information from participants consisted of both open- and closed-ended questions. According to Trochim (2006: 38), a qualitative approach is a general way of thinking about conducting qualitative research. It describes, either explicitly or implicitly, the purpose of the qualitative research, the role of the researcher, the stages of research, and the method of data analysis. The purpose of using this qualitative research is clearly interpreted by Imenda and Muyangwa (2006: 92) as, “it seeks to give description of situations and events as they appear or occur without manipulation by the researcher”.

In quantitative studies, the mass of data does not shape and limit the analyses, for example, if you collect data based on simple interval-level quantitative measure, the analyses are likely to be fairly delimited (descriptive statistics, correlation, regression or multivariate models are used). Generalisation in the quantitative mode also tends to be fairly straightforward because some aggregate statistics such as a mean or median are computed from the same variable collected from everyone in the sample. Ultimately, quantitative research reaches generalisation based on statistical projections (Conco; 2004: 27). According to Selesho (2008: 95), quantitative research is based on the collection and analysis of numerical data, usually obtained from questionnaires, tests,

checklists and other formal paper-and-pencil instruments. In this regard, quantitative research entails more than just the use of numerical data, as it involves maintaining control over contextual factors that might interfere with the data to be collected.

While the research approach is the cornerstone for the research focus, it is important to describe as well as differentiate between the two approaches; Willig and Rogers (2008: 359) define qualitative research as an ideal method of inductive (*inter alia* data based) hypotheses generation, since it is unnecessary to identify in advance which factors will prove relevant. They emphasise that qualitative research can therefore be used as a means of carrying out the qualitative theory-building process, that must inevitably precede quantitative hypothesis testing, more systematically, and that it is typically associated with interpretive or constructivist paradigms (Willig & Rogers; 2008: 353).

Ary, Jacobs, Sorensen and Razavieh (2010: 420) elaborate that quantitative research strives for testable and confirmable theories that explain phenomena by showing how they are derived from theoretical assumptions. While qualitative begins from a different assumption, namely that the subject matter of the social or human sciences differs fundamentally from the subject matter of the physical or natural sciences and therefore requires a different goal for inquiry, and a different set of methods for investigations. Ary *et al*. (2010: 420) further emphasise that qualitative research seeks to understand and interpret human and social behaviour as it is lived by participants in a particular social setting. It is an intensely personal kind of research; one that freely acknowledges and admits the subjective perceptions and biases of both participants and researcher.

3.3.2 Research design

According to Imenda and Muyangwa (2006: 25) research design is defined as the basic plan of a study, therefore, the term refers to how the study was intended to be carried out. For this study, the researcher used evaluation research, which Imenda and Muyangwa (2006: 32) define as research that involves the systematic collection of information on the worth of programmes, products and techniques, and then using the

information to make judgements. Imenda and Muyangwa (2006: 32) state that there are three kinds of evaluation research; need assessment, evaluation of new programmes during the development process, and evaluation of completed programmes of study. For this study, the researcher focused on the completed programmes of study.

A research design is a planned frame for action that serves as a connection between research question performance and the application of the research problem (Terre Blanche, Durrheim & Painter*.;* 2006: 37). It can also be described as the plans that guide the progression and the logistic that assisted in the collection and analysis of data (Terre Blanche *et al.;* 2006). In conforming to the above-mentioned statement, the study intends to collectively support the research objectives that are to identify challenges experienced by educators in facilitating CAT in their classrooms and finally, to identify skills required by educators in order to their improve teaching and learning of CAT in secondary schools in the Free State Province (Section 1.2.1) by means of the qualitative approach. A qualitative research approach was applied in this study because it was considered to be a more relevant approach, because of the research design and the data collection instruments (Cohen, Manion & Morrison; 2011:223).

In order for the researcher to address the research questions (Section 1.6), the evaluation study was used as the most appropriate design. The reason for this was that more in-depth understanding could be obtained, as the process is less reactive than any other interactive strategies where the researcher extracts evidence. McMillan and Schumacher (2010: 361) confirmed this when they defined evaluation study as, “a non-interactive strategy for obtaining qualitative data with little or no reciprocity between the researcher and the participant’’. In this study, the questionnaires “serve as an immediate practical purpose” by providing detailed accounts of events that unfolded during the training (McMillan & Schumacher; 2006: 426).

Given the exploratory and limited nature of this study (Section 1.6), the researcher decided to focus only on Motheo District. The research design for the study was evaluation research as stated, which is defined by Imenda and Muyangwa (2006: 32) as

research that involves the systematic collection of information on the worth of programmes, products and techniques, and then using this information to make value judgments. In this study, the researcher did make use of summative evaluation as it examines the effects or outcomes of some object. Summative evaluation describes what happens subsequent to delivery of the programme or technology; assesses whether the object can be said to have caused the outcome; determines the overall impact of the causal factor beyond only the immediate target outcomes; and estimates the relative cost associated with object (Trochim; 2006: 2).

Unfortunately, evaluation research methods have often been incorrectly considered a monopoly of professional historians, librarians and information science specialists, whilst social scientists rely on surveys and in-depth interview methods, in particular, the professional sociologist. In the event that social scientists use documentary research methods, it is only to supplement information collected through social surveys and in-depth interviews, but seldom as the main or principal research method. In order to undertake a research project, most students tend almost instinctively to think of questionnaires as the tools of data collection (Gaborone; 2006: 221). Although social surveys are a respected research method, they are not always appropriate or cost effective. This study is to show that documentary research in social science is a useful and under-utilised approach that can be adopted by researchers in the full confidence that it is also a scientific method that requires rigorous adherence to research protocol.

The evaluation method that was carried out by the researcher is summative evaluation, as it will be carried out on finished INSET programmes and is designed to determine the effectiveness of these INSET programmes.

3.4 RESEARCH INSTRUMENTS

In this research, a questionnaire was used as the main data-gathering instrument. The literature review (with special reference to the teaching of CAT) will serve as the basis on which the evaluation questionnaires are drawn, constructed and then applied as the

research instrument. This study will make use of both the quantitative and qualitative approach.

The research instruments used for this study are discussed below:

3.4.1 Questionnaires

A questionnaire was designed for educators to determine the impact of INSET towards themselves, as computer application technology educators. The questionnaire consisted of three categories. Category 1 focused on personal information with the purpose of gathering background information of research participants relating to the study. Category 2 focused on the competence level of the primary tool for teaching and learning (Section 1.5) this category addresses the second research question (section 1.6). Category 3 of the questionnaire focused on capacity development; it contained questions focused on the educator's reflection on INSET, infrastructure, facilitation, challenges still encountered by educators of facilitation in classrooms, enhancement of needs, opinions regarding content and time of training programs, and registration or the possession of qualifications relevant to the CAT learning area. This category addresses the first research question (section 1.6).

The rating scale that was used in this questionnaire was the Likert scale. According to Ng and Coakes (2013:57), a Likert scale is regarded by researchers as a closed-circuit research tool in that it presents a closed set of answers. Three open-ended questions were used in Category 3 in order to allow the respondent to provide the researcher with the rational for a decision or choice that was made (Azzara; 2010: 170).

The title of the questionnaire was: An impact assessment on INSET programmes of computer application technology educators in the Free State Province.

The researcher favoured the use of questionnaires as one of the data collection instruments, as it offers an objective means of collecting information about people's

knowledge, beliefs, attitudes and behaviour (Rabie; 2007: 112). Webster (2008: 1) declares that a questionnaire that is appropriately structured and reliably administered becomes a fundamental instrument by which statements can be made about specific groups, or people, or an entire population. The use of a questionnaire was selected as it is relatively economical and is easy to obtain information from participants in a short period of time.

A questionnaire is a formalised set of questions for obtaining information from respondents. The overriding objective is to translate the researcher's information needs into a set of specific questions that respondents are willing and able to answer (Grover & Vriens; 2006: 176). Imenda and Muyangwa (2006: 120) emphasise that predictably, questionnaires are used to assemble data from large numbers of people about the way they think and behave. The questionnaire was distributed to CAT educators to gather information relating to the research questions (Section 1.6) at a workshop, which was organised for CAT educators, at Eunice High School in the Free State (Section 1.12)

Wilkinson and Birmingham (2003: 80) say questionnaires are designed and used to collect vast quantities of data from a variety of respondents. They have a number of benefits over other forms of data collection in that they are usually inexpensive to administer, very little training is needed to develop them, and they can be easily and quickly analysed once completed. Wilkinson and Birmingham (2003: 8) further state that an effective questionnaire is one that enables the transmission of useful and accurate information or data from the respondent to the researcher (Hawkins; 2009: 16). It is an effective way of collecting most types of information quickly and relatively cheaply. Questionnaires allow a survey with no or little personal interaction, with the aim of establishing a broad picture of the respondents' personal experiences and perceptions (Hawkins; 2009: 80).

3.5 POPULATION AND SAMPLING

The population and the sample chosen for this study is discussed below:

3.5.1 Population

Population is described as the set of elements that the research focused upon, and to which the results obtained by testing a sample should be generalised (Bless, Higson-Smith & Kagee; 2006: 99). The population for this study was all educators teaching CAT in Free State Province, which include Motheo District, Thabo Mofutsanyana District, Lejeleputswa District, Fezile Dabi District and Xhariep District. The choice of the province was based on the fact that selected subjects were challenged in terms of the provincial resource retention strategies in schools, stealing of computers, and maintenance, to a large degree.

Population is a set of all individuals of interest in a particular study (Gravetter, Larry & Wallnau; 2010: 4). Babbie (2010: 214) defines population as an aggregation of elements from which the sample is actually selected.

The Figure 1.1 indicates the relationship between the population and sample. It indicates how participants are selected from the population in order to participate in the research study and later on provides results.

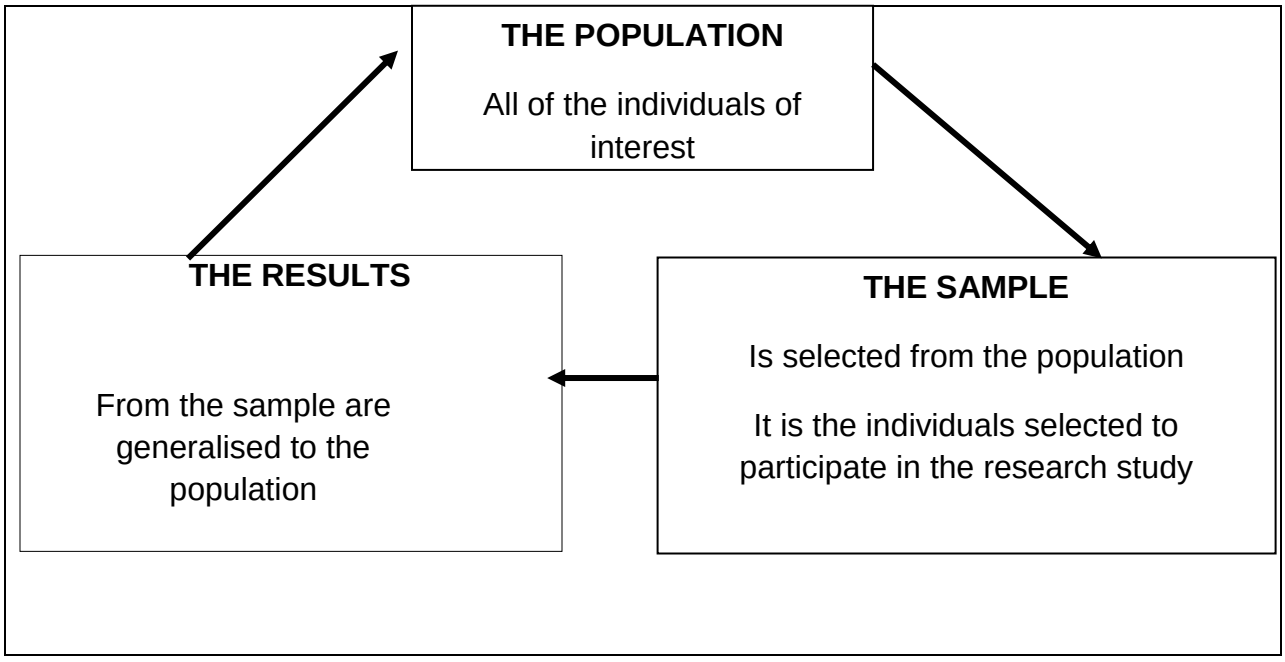

Figure 3: The relationship between population and sample
Model adapted from Gravetter and Wallnau (2008:06)

3.5.2 Sampling

Page, Carr and Eardley (2012: 66) define sampling as a group of participants or materials, which are selected to be the object of the study. Hossain (2011: 146) states that in qualitative research, to explore the diversity, the researcher needs to reach what is known as saturation point. When he/she finds that he/she is not obtaining any new data, or the new information is negligible, the researcher is assumed to have reached saturation point. This point is a subjective judgment that is decided by the researcher.

In selecting a sample from a sampling frame, the goal is to do so in such a way that it is representative of the population. The best way of ensuring that the sample is representative is to make sure that all people in the population have an equal (or at

least known) chance of being included. In this study, the research sample consisted of CAT educators at secondary schools in Motheo district in the Free State Province. There are two broad types of samples, probability sampling and non-probability sampling. Probability samples are the surest way of obtaining samples, which are representative of the population. The goal of sampling is to obtain a sample that properly mirrors the population it is designed to represent (De Vaus; 2013: 67).

The researcher selected non-probability sampling as the sampling technique for this research. Non-probability sampling is any sampling method where some elements of the population have no chance of selection. It involves the selection of elements based on assumptions regarding the population of interest, which form the criteria for selection (Pathak; 2008: 46). Non-probability sampling includes snowball sampling, judgemental sampling or purposive sampling, deviant cases, case studies, and *ad hoc* quotas. The researcher has drawn purposive sampling for this study (see Chapter 1).

3.6 ETHICAL ISSUES

Trochim (2006: 1) states that to try to protect the rights of research participants, there are a number of key phrases that describe the system of ethical protections, which the contemporary social and medical research establishments have created.

- **Voluntary participation:** People are not coerced into participating in the research. This is especially relevant where researchers had previously relied on 'captive audiences' for their subjects, *inter alia* prisons, universities, and places like that.
- **Informed consent:** Essentially, this means that prospective research participants must be fully informed about the procedures and risks involved in research, and must give their consent to participate (Appendix C - Cover letter for research questionnaire).
- **Risk of harm:** Ethical standards require that researchers not put participants in a situation where they might be at harm as a result of their

participation. Harm can be defined as both physical and psychological. (Appendix D - Research questionnaire)

- **Confidentiality and Anonymity*:*** Two standards are applied in order to help protect the privacy of research participants. Almost all research guarantees the participants' **confidentiality;** they are assured that identifying information will not be made available to anyone who is not directly involved in the study. The stricter standard is the principle of **anonymity,** which essentially means that the participant will remain anonymous throughout the study, even to the researchers themselves. Clearly, the anonymity standard is a stronger guarantee of privacy, but it is sometimes difficult to accomplish, especially in situations where participants have to be measured at multiple time points (Trochim; 2006: 1) (Appendix D - Research questionnaire)

Willig and Rogers (2008: 265) also put emphasis that the researchers should protect their participants from any harm or loss, and they should aim to preserve their psychological well-being and dignity at all times.

Willig (2001: 16) states that

> The role of participants in qualitative research can differ dramatically from that of the 'subjects' of quantitative studies. There are, however, also big differences between qualitative methodologies in this regard. At one end of the continuum, there are qualitative methodologies, such as feminist approaches, participatory action research, or memory work, where distinction between researcher and participant is blurred. Here, the researcher becomes a participant in the research, and the participants contribute to the analysis of the data they generate at the other end of the continuum, there are qualitative methodologies, such as conversation analysis or discursive psychology,

where participants generate the type of data required by the researcher without any further involvement in the research.

3.7 ENSURING VALIDITY

Sintes-Yallen; (2008: 17) state that validity determines whether the research truly measures that which it was intended to measure, or how truthful the research results are. McMillan and Schumacher (2006: 41) state that validity refers to the degree of congruence between the explanations of the phenomena and the realities of the world. Disagreement occurs between the names of specific concepts; reflexivity and extension of findings are the other words that can be used in this regard (Bashir; 2008: 41). Golafashani (2003: 41) explains that validity or trustworthiness can be maximised, and a more credible and defensible result may lead to generalisability, which is one of the concepts suggested by Bashir (2008: 37) as the structure for both doing and documenting high quality qualitative research. Therefore, the quality of a research relates to generalisability of the result, and thereby, to the testing and increasing the validity or trustworthiness of the research (Bashir; 2008: 37).

3.8 THE PILOT STUDY

Imenda and Muyangwa (2006: 75) define a pilot study as a preliminary trial of research measures and techniques intended to ascertain their appropriateness in addressing the stated research questions, hypotheses and/or objectives.

A pilot study was conducted and 15 questionnaires were administered to 15 educators to determine the clarity of the questionnaire items and instructions, to gain feedback on the validity of the questionnaire items, and to eliminate ambiguities or difficulties in the wording (Ndamani; 2005: 85). After the distribution of the questionnaires, all corrections were made to the questionnaire to assure the quality of questions asked.

3.9 DATA ANALYSIS AND INTERPRETATION

Data analysis is the process by which you recognise patterns in qualitative data and turn those patterns into meaningful categories and themes (Ponterotto; 2009: 421). Similarly, McKenzie & Cottrell (2010: 06) contend that qualitative researchers use inductive reasoning by making specific observations and then drawing inferences about larger and more general phenomena. Jantjies (2011: 12) further contends, “qualitative analysis is a systematic process of selecting, categorising, comparing, synthesising and interpreting to provide explanations of the single phenomenon of interest”.

In analysing data for the current study, the researcher collected data through the use of the questionnaires (Appendix B). The closed-ended questionnaires were seen as suitable instruments to be used in collecting data among the educators. The study only focused on the educator development of CAT, although there were many issues emanating from the respondents and their colleagues. A descriptive statistics was used to analyse and summarise data sets. (Mc Nabb; 2008: 153).

In view of the envisaged focus, a framework was designed on how to record the data of both self-evaluations compiled by the schools as well as the reviewers reports (Table 4.1). A process of analysing data was followed by firstly, identifying particular patterns and themes that outline and address the three main aspects of the conclusion(s) thereof. A comparison was made between the similar information gathered in both reports, and points of major similarity were identified by reviewers.

3.9.1 Reporting of data

The HEQC criteria were analysed according to the HEQC guidelines and served as a basis for documentary analysis. Data were then coded according to the three selected aspects emanating from the self-evaluation reports and the audit reports from the reviewers.

3.10 SUMMARY

This chapter described the research design of the study. It also identified the population and sample from which data were collected. The validity and reliability of the instrumentation used, and how data were to be collected and analysed, was described in the study. A pilot study was also conducted using the instrumentation used, and reasons were provided for the use of a pilot study.

What follows is Chapter 4, which deals with the data collection and analysis in which all relevant data derived from the study is reported.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

This chapter discusses the data analysis and findings according to the educators' responses to the questions posed in the questionnaire. The findings were deducted from a questionnaire (section 3.4) , which was distributed to educators teaching CAT to grade 10 to 12 learners in secondary schools in the Free State Province at a provincial workshop for CAT educators that was held for two days. In the data analysis, descriptive statistics were used to describe and summarise the properties of the mass of data collected from the respondents (Cavas, Karaoglan, Kisla; 2009: 20). Data was collected through the use of questionnaires after the INSET programme.

The questionnaire was divided into three categories. The Category 1 focused on personal information, Category 2 focused on the competency level of primary tool for teaching and learning (section 3.4) use level, which addressed the first research question (Chapter 1; 1.6), and the third category addressed the second research question (Chapter 1; 1.6), focussing on the capacity development programs offered to educators by the Free State Department of Education (FSDoE). 50 questionnaires were distributed, and only 40 respondents completed and returned to the researcher. The researcher analysed the 40 questionnaires by using the self-constructed tables guided by the American Psychological Association (APA) table design method (section 3.9), which were self-constructed through guidance of the table design method, and the following findings were established:

4.2 CATEGORY 1: DEMOGRAPHICS OF RESEARCH PARTICIPANTS

In this category, respondents were requested to answer by making a tick next to the correct optional answers regarding the following aspects:

- Age
- Teaching experience
- Computer teaching experience
- Total number of training sessions
- Computer use prior to training
- Computer use at home

The table below provides information on the age of the research participants**.** In this item participants were requested to tick next to the following age ranges: Between 20-30, 31-40, 41-50 and 51 years and older.

Table 4.1: Age of the research participants (N=40)

	Age between 20-30 years		**Age between 31-40 years**		**Age between 41-50 years**		**Age above 51 years and older**	
Question	**Participants**	**%**	**Participants**	**%**	**Participants**	**%**	**Participants**	**%**
Age of CAT educators	17	(42%)	13	(33%)	6	(15%)	4	(10%)

Table 4.1 presents the age of CAT educators is spread over a wide age-range. The table further reveals the age category as follows: 42 percent of educators were between 20-30 years; 33 percent were between 31-40 years; 15 percent were between 41-50 years; and 10 percent were 51 years and above.

Table 4.1 indicates that the majority of CAT educators were between 20-30 years.

Table 4.2 shows the participants' teaching and computer experience. In this item participants were requested to make a tick next to the following: 1-5 years, 6-10 years, and 11 years and older.

Table 4.2: Teaching and computer experience of the research participants (N=40)

	1-5 years		6-10 years		11 years and more	
Question	**Participants**	**%**	**Participants**	**%**	**Participants**	**%**
Teaching experience	22	(55%)	8	(20%)	10	(25%)
Experience with computers	17	(42%)	19	(47.5%)	4	(10%)

From Table 4.2, it is clear that 22 (55 percent) educators had teaching experience of 1-5 years, whilst eight (20 percent) educators had teaching experience of 6-10 years, and ten (25 percent) educators had experience of 11 years and more. Furthermore, the table reveals that 17 (42 percent) educators had 1-5 years of experience with computers, 19 (47.5 percent) had 6-10 years' experience with computers and four (10 percent) educators had more than 11 years of experience with computers.

The table above indicates that the majority of educators had 6-10 years in teaching and computer experience.

Table 4.3 provides a response profile pertaining to the training sessions attended by CAT educators. In this item the educators had to tick the following ranges: 1-5 sessions, 6-10 sessions and 11 and more.

Table 4.3: Training sessions attended by research participants (N=40)

	1-5 Sessions		6-10 Sessions		11 and more	
Question	**Participants**	**%**	**Participants**	**%**	**Participants**	**%**
Training sessions	22	(55%)	8	(20%)	10	(25%)

In table 4.3 educators had to indicate the number of training sessions attended, and 22 (55 percent) educators indicated that they attended between 1-5 training sessions, ten (25 percent) educators indicated attendance of 6-10 training sessions, and eight (20 percent) educators indicated attendance of 11 and more training sessions.

Table 4.3 indicates that the majority of educators indicated they attended 1-5 training sessions.

In Table 4.4 Computer use prior to training is portrayed, as well as the level of computer use. In this item participants had to respond with a YES or NO answer.

Table 4.4: Computer use prior to training and at home: N=40

Question	Participants (YES)	(%)	Participants (NO)	%
Computer use prior to training	38	(95%)	2	(5%)
Computer use at home	39	(97.5%)	1	(2.5%)

Educators responded positively (YES) to the use of computers prior to their training, at home. 38 (95 percent) educators indicated that they had used computers prior to attending training sessions, and two (5 percent) responded negatively (NO). Regarding the use of computers at home, 39 (97.5 percent) educators responded positively (YES) that they used a computer at home and only one (2.5 percent) responded negatively (NO) to the use of a computer at home.

In table 4.4 the majority of educators indicated that they had used computers prior to attending training sessions.

4.3 CATEGORY 2: COMPUTER USE LEVELS

In this category the participants were requested to rate their views about their computer usage using the following Likert-scale: Excellent, good, poor and not relevant, by making a tick next to the correct answer.

Table 4.5 indicates educators' views in the following: Computer use, confidence, knowledge, integration, interest and their reflection on the training programme, its facilitation, and the learning infrastructure.

Table 4.5: Educators' level on computer use, confidence, knowledge, integration, interest, and reflection on training and learning infrastructure (N=40)

	Excellent		Good		Poor		Not relevant	
Question	**Participants**	**%**	**Participants**	**%**	**Participants**	**%**	**Participants**	**%**
Level of computer use	0	0%	40	100%	0	0%	0	0%
Confidence with regard to computer use	0	0%	40	100%	0	0%	0	0%
Level of knowledge using computers	0	0%	39	97.5%	1	2.5%	0	0%
Level of integration with regard to	0	0%	34	85%	6	15%	0	0%

computers								
Level of interest in using the computer	0	0%	38	95%	2	5%	0	0%
Reflection on training programme offered	8	20%	23	57.5%	5	12.5%	4	10%
Reflection on the facilitation process of the programme	7	17.5%	24	60%	6	15%	3	7.5%
Reflection on the learning infrastructure	19	47.5%	13	32.5%	3	7.5%	5	12.5%

The responses of educators with regard to their level of computer use revealed the following:

From the total of 40 educators, the following answers were provided, 40 (100 percent) responded that their level of computer use was good. Their confidence with regard to computers indicated that all 40 (100 percent) educators' confidence levels were good. Furthermore the research looked at the level of knowledge of using computers, and Table 4.5 reveals that 39 (97.5 percent) of educators' level of knowledge at using computers was good, and one (2.5 percent) educators indicated that the level of computer knowledge was poor. This indicated that 39 (97.5 percent) of the educators have knowledge in using computers, which may influence student achievement, which will lead to educators developing a positive attitude toward technology performance. The table further illustrated the responses of educators' level of integration with regard to computers. Out of the 40 educators, the following answers were provided: 34 (85 percent) responded that their level of integration was good and six (15 percent) indicated that their level of integration was poor, which point out the educators' level of interest in using computers. Thirty-eight (95 percent) educators responded that their

level of interest in using the computer was good and two (5 percent) educators indicated that their level of interest was poor.

Educators were also requested to provide answers on their reflection of the training programme, its facilitation and the learning infrastructure and the following information was provided:

In Table 4.5, educators responses on reflection with regard to training programs offered showed that eight (20 percent) responded that the programs were excellent, 23 (57.5 percent) responded that they were good, five (12.5 percent) responded that they were poor and four (10 percent) responded that they were not relevant. Furthermore, their response on their reflection of the facilitation process of the programme showed that seven (17.5 percent) educators indicated that the facilitation process was excellent, 24 (60 percent) answered good while six (15 percent) answered poor and three (7.5 percent) answered not relevant. Lastly, on the reflection of learning infrastructure educators provided the following, 19 (47.5 percent) educators indicated the training as excellent, 13 (32.5 percent) answered good and three (7.5 percent) answered poor. Five (12.5) regarded this as not relevant.

In table 4.5 all educators indicated that their confidence levels and their use of computers were good. The majority of educators indicated that their level of knowledge, integration and interest in using computers was good. Furthermore, the majority of educators indicated that their view on the reflection of the training programme, facilitation process was good. Lastly the reflection on the learning infrastructure was viewed as excellent by the majority of educators.

Table 4.6 presents information of educators' capacity development through INSET. In this item educators are requested to answer the following Likert-scale: Yes, No and No answer.

Table 4.6 indicates how educators responded to the following items: Training programme offered previously, focus on enhancing the needs as CAT educators,

challenges encountered after attending training sessions, training sessions provision of required skill to improve facilitation, and registration for/or in possession of qualification relevant to CAT learning area.

Table 4.6: Capacity development through INSET

Indicator Levels	YES		NO		NO ANSWER	
Measure	**Participants**	**%**	**Participants**	**%**	**Participants**	**%**
Training programme offered previously	9	22.5%	24	60%	7	17.5%
Focus on enhancing your needs as CAT educator	38	95%	2	5%	0	0%
Challenges encountered after attending training sessions	25	62.5%	15	37.5%	0	0%
Training sessions provision of required skill to improve facilitation	37	92.5%	3	7.5%	0	0%
Registration for or in possession of qualification relevant to CAT learning area	36	90%	3	7.5%	1	2.5%

Table 4.6 indicates the responses of the educators to the following question: In your opinion would you change anything about the training programme offered previously? 33 educators answered this item, nine (22.5 percent) answered YES, 24 (60 percent) answered NO, and seven (17.5 percent) provided no answer to the question posed. Table 4.6 further provides responses to the question posed to educators regarding focus on enhancing training needs as CAT educators, and the responses showed that 40 educators completed this item and 38 (95 percent) educators responded YES while two (5 percent) responded NO to the research question. Responses towards the

question on challenges encountered after attending training sessions were as follows: 25 (62.5 percent) educators indicated that they still encountered challenges after attending training sessions and 15 (37.5 percent) educators responded NO. Furthermore, Table 4.6 also makes provision for responses made on the training session provision of required skills to improve facilitation, and 37 (92 percent) responded YES, with three (7.5 percent) responding NO.

Lastly, educators were requested to provide information on their registration for/in possession of a qualification relevant to CAT learning area (Table 4.6). The following responses were provided for this question: 39 educators answered this item and 36 (90 percent) responded that they are formally registered for, or were in possession of, a qualification relevant to the CAT learning area, while three (7.5 percent) responded NO. Only one did not respond to this question.

In table 4.6 the majority of educators indicated that they would not change anything about the training programme offered previously. They further indicated that the programme did focus on enhancing their needs as CAT educators. Furthermore, the majority of educators indicated that they sill encountered challenges after attending training sessions. The majority of educators' further indicated that they training sessions provided them with the required skills in order to improve their facilitation. Lastly, the majority of educators indicated that they are formally registered for, or were in possession of a qualification relevant to the CAT learning area.

In the following questions: 3, 4, 5 and 8 in Category 3 (Appendix D, Research questionnaire) educators who answered NO were requested to provide an explanation for their answer. Various explanations were provided to the different questions posed.

Question 3: Did the training programme focus on enhancing your needs as a CAT Educator?

Educators indicated that training programmes did focus on enhancing their needs as CAT Educators, whilst a few provided explanations as to why they were not satisfied. The following quotes were provided:

“NO, my needs were not met; we were not asked how our computer lab or infrastructure is”? and that “NO, presenter’s language is poor”. They felt it was very important to establish the school background of different educators and thereafter focus on the enhancement of content and other aspects.

The following explanations were supplied for the question below:

Question 4: After attending training sessions, did you still encounter challenges in your facilitation?

Educators indicated that after attending the training sessions they no longer encountered challenges in their facilitation .They indicated that they could also depend on their peers for assistance when encountering certain problems, and they felt that the training sessions greatly changed and developed their knowledge for understanding certain topics. The following quotes were provided:

“NO, I am now able to make some functions that usually gave me a headache”; NO, there are very few challenges that I have encountered most times I consult my peer educators for help”, “NO, because it greatly changed and developed the knowledge I had” and “NO, I am clear about certain topics especially from Office 2003 to 2007”.

Question 5: Did the training sessions provide you with the required skills, which will assist you in improving your teaching and learning?

Educators indicated that training sessions provided them with the required skills, which will assist in improving their teaching and learning. Whilst a few educators disagreed by responding as follows:

“NO, poor presenting”; “NO, require skills in dealing with children with disabilities”. “No, my needs where not met, for we were not asked how is our computer lab” and “NO, not enough actual training on difficult topics, specific tutorials on ‘how to’s’ need to be included not just questions”.

From these quotes above some educators still require more skills in dealing with children with disabilities, and educators further emphasise that not enough training was invested in difficult topics, and that specific tutorials need to be included in the content covered at training sessions.

Question 8: Are you formally registered for, or in possession of, any qualification relevant to the CAT learning area?

Only one educator answered “NO” to this question. The following quote is provided:

“I only have experience through in service training”.

From the quote above, this indicates that this educator is not formally registered for, or in possession of, any qualification relevant to the CAT learning area; thus the importance of INSET programme to keep abreast with new developments and the accumulation of required skill to teach CAT.

4.4 OPEN–ENDED QUESTIONS

Category 3 of the questionnaire had three open-ended questions. In Question 6 and 7, respondents were requested to provide their own opinions with regard to the content of the training programme and the duration of the programme. In Question 9, respondents were requested to provide other comments. The following responses were provided for the different questions:

Question 6: Give your opinion with regard to the content of the training programme

Educators were given the opportunity to provide their views with regard to the content of the training programme. However, there was no uniformity in the way educators felt about the content of the training programme. Most educators indicated that they were unsatisfied with the content, as it did not cater for learners with disabilities. They further stated that the content was not relevant to the syllabus and was not adjusted to provide what they were to teach in schools. Educators pointed out that they should not be grouped with those who are just starting to attend training sessions, as some were more advanced. They even went to the extent of stating the following:

“Training content was mediocre”

Some educators indicated their satisfaction with the content of the training programme. They said that the content was good, even excellent, and skills-driven, and that it focused on difficult formulas in the specific subject. They further stated that it assisted them with problem areas encountered in their classes, that it was insightful, relevant and it enhanced their needs. The environment of the training was motivating and allowed them to socialise and meet with other educators who were experiencing the same difficulties in their classes. The training provided a platform for sharing ideas, which will assist them to solve specific problems. Some educators did not give their opinions regarding the content.

Question 7: Educator's opinion with regard to the duration of the training programme

Educators were given the opportunity to provide their views on the duration of the training programme and the following quotes were stated:

"The duration of the training programmes must be increased as there are many problems that we encounter in certain programs. At least duration of a week"
"It is well planned it is good timing"
"The progress is too slow for a teacher that is experienced"
"The time (days) are few, next training must be done for the whole week – to treat chapters of the following term"
"The duration is enough"
"Time period is ok, as long as it is done regularly"

Educators indicated that the length of training programme could be shortened, as some educators are more advanced users of computers than others. The majority of the educators felt that the sessions were too short and they felt a need for the training programme to be extended by a week, which will render them more time. Other educators indicated that the training sessions were adequate, and well planned. They indicated that the duration of the training was perfect, and training sessions should be done on a regular basis.

Question 9: Other comments

In this item, educators were provided with an opportunity to state their views regarding anything which will be relevant to the study, which that was not addressed in the questionnaire. The following quotes were provided:

"Can we please get more material?"
"At the end of this course I will be able to teach CAT at a school"

“This course will help many educators regarding their work because everything is technological these years”
“It is really appreciated; the CAT learning facilitators are really trying to assist us to improve the results and success in teaching to the learners”
“More CAT educators needs training in operational knowledge and the technical side (repairs) of the computers”
“Training was well organised, and we would like to see the status quo being maintained through and through”
“Good workshop”

They stated that the training was well organised and that it should be maintained as is; they further indicated that they were grateful to the facilitators for doing a good job in assisting them to improve their learners results and their success in teaching learners. Most importantly, they indicated that there was a need for more training in operational knowledge and the technical side (repairs) of the computer.

4.5 PRELIMINARY FINDINGS

The following preliminary findings were sourced from the responses provided by the participants.

Table 4.1 indicated that the majority of CAT educators were between 20-30 years. Table 4.2 above indicated that the majority of educators had 6-10 years in teaching and computer experience.
Table 4.3 indicates that the majority of educators indicated they attended 1-5 training sessions.
In table 4.4 the majority of educators indicated that they had used computers prior to attending training sessions.
In table 4.5 all educators indicated that their confidence levels and their use of computers were good. The majority of educators indicated that their level of knowledge, integration and interest in using computers was good. Furthermore, the majority of

educators indicated that their view on the reflection of the training programme, facilitation process was good. Lastly the reflection on the learning infrastructure was viewed as excellent by the majority of educators.

In table 4.6 the majority of educators indicated that they would not change anything about the training programme offered previously. They further indicated that the programme did focus on enhancing their needs as CAT educators. Furthermore, the majority of educators indicated that they sill encountered challenges after attending training sessions. The majority of educators' further indicated that they training sessions provided them with the required skills in order to improve their facilitation. Lastly, the majority of educators indicated that they are formally registered for, or were in possession of a qualification relevant to the CAT learning area.

Item 6 and 7 in this category were open-ended questions, as educators were requested to provide their own views, and Question 9 was for other comments.

In item 6 some educators indicated their satisfaction with the content of the training programme. They said that the content was good, even excellent, and skills-driven, and that it focused on difficult formulas in the specific subject. They further stated that it assisted them with problem areas encountered in their classes, that it was insightful, relevant and it enhanced their needs. The environment of the training was motivating and allowed them to socialise and meet with other educators who were experiencing the same difficulties in their classes. The training provided a platform for sharing ideas, which will assist them to solve specific problems. Some educators did not give their opinions regarding the content.

In Item 7 educators indicated that the length of training programme could be shortened, as some educators are more advanced users of computers than others. The majority of the educators felt that the sessions were too short and they felt a need for the training programme to be extended by a week, which will render them more time. Other educators indicated that the training sessions were adequate, and well planned. They

indicated that the duration of the training was perfect, and training sessions should be done on a regular basis.

Item 9 educators' stated that the training was well organised and that it should be maintained as is; they further indicated that they were grateful to the facilitators for doing a good job in assisting them to improve their learners results and their success in teaching learners. Most importantly, they indicated that there was a need for more training in operational knowledge and the technical side (repairs) of the computer.

4.6 SUMMARY

The study aimed at assessing the INSET programme offered to CAT educators with regard to its facilitation and challenges encountered in secondary schools in the Free State Province. The results of the study were drawn from answers provided by the educators from the questionnaire. This chapter has analysed the presented findings of the study in the form of tables and in narrative when it came to open-ended questions.

Chapter 5 presents the summary of the findings, the conclusion and recommendations.

CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

The previous chapter discussed data presentation and analysis. This chapter presents a summary of the study that was conducted. The summary is going to include the following: The purpose of the study, a restatement of research questions (Chapter 1), research methodology that was used (Chapter 3), a discussion on the findings, conclusions and recommendations of the study.

5.1 SUMMARY

5.1.1 Purpose of the study

The purpose of the study was to assess the impact of training programmes to CAT educators on the quality of teaching and learning in CAT classrooms in secondary schools (Chapter 1: 1.7).

5.1.2 Restatement of research questions

The main research question was: What is the impact of INSET on CAT educators in secondary schools in the Free State? In order to answer this question the following subsidiary questions were formulated:

- What are the challenges experienced by educators in implementing CAT in classrooms after participating in the INSET programme?
- What are the skills that educators lacked in order to improve the teaching of CAT after participating in the INSET programme? (Chapter 1; 1.6).

5.1.3 Research design, approach and methodology

The research design for this study was the evaluation design. Both the qualitative and quantitative approaches were used, and the survey method was chosen. The sample method of the study was non-probability sampling. Purposive sampling was chosen to select the sample for the study, which in this instance was educators teaching CAT in 45 secondary schools in Motheo district in the Free State Province.

A self-constructed questionnaire (Chapter 3) was used to collect qualitative and quantitative data. The researcher made use of a questionnaire as it can be used to collect vast quantities of data from a variety of educator's responses (see Chapter 1). A letter was attached to each questionnaire that was distributed for the participants to understand the intention of the study (see Appendix C). The distribution of the questionnaire was conducted at the beginning of a two day open workshop held by the Department of Education, for CAT educators, and the completed questionnaires were collected on the last day of the workshop.

5.1.4 Discussion of findings

A discussion on findings from the research questions will be presented below: (see Chapter 3).

What are the skills that educators lack in order to improve the teaching of CAT after participating in the INSET training programme?

Items were based on personal information of participants and the following was deducted regarding the age of participants. The data in this question of age indicated that 42 percent of educators ranged between the ages of 20-30 years. This means that this statement is in line with a study by Westerman and Davies (2000: 478) who states that young people generally have been provided with greater opportunities and incentives to develop skills than have their older counterparts (see Chapter 2). In the

question of teaching experience, the researcher wanted to find out if teaching experience played a vital role in the teaching of CAT. The data in this research question indicated that 55 percent of educators had teaching experience of 1-5 years. The findings reveal that the majority of educators have less than 5 years' experience, meaning that they might still need to enhance their skills in teaching (see Chapter 2).
Educators' responses with regard to experience with computers indicated that 47,5 percent had 6-10 years' experience. The findings in this question indicated that the majority of educators had computer experience. This means that they are in a better position to mentor or assist future educators since they should suggest approaches for using ICT in actual classroom situations (see Chapter 2).

The data on the total number of training sessions that educators attended indicated that 55 percent attended training sessions, whilst some educators have attended more than 11 training sessions. The finding that is being deducted on this question is that the majority of educators might not have attended all training sessions, which were offered. This leads to educators being neither sufficiently prepared nor adequately confident to carry out full integration of ICT in their classroom (see Chapter 2). Furthermore, 95 percent indicated that they had used computers prior to attending training sessions. The findings in this question indicated that the majority of educators teaching CAT have access to computers, which means that they had some prior knowledge on use before attending their training sessions. 97,5 percent also indicated that they used computers at home. The finding on this question indicated high levels of computer use at home and at work, which improved the quality of current practices through better preparation and student testing.

The data on the question of the level of computer use indicated that all (100 percent) educators in the study rated their level of computer use as good. This indicates that the training programme facilitators do not necessarily have to focus on the basic computer skills when planning their training sessions, and it also implies that educators have a better knowledge and understanding of the tool that they use in their respective classrooms. All (100 percent) educators also indicated that their measurement of

confidence regarding computer use was good; this finding differs with the one of the educator level barriers that indicates that confidence is one of the barriers that prevents educators from using ICT in their teaching. Furthermore, 95,5 percent indicated that they have a good level of computer use. This finding indicates that these educators will have no problem in transferring learning to their learners, which will influence learner achievement.

Educators were also requested to respond on their level of integration (theory is put into practice by means of software and hardware) of computers in classroom. Their data indicated that 85 percent of educators felt that their level of integration with computers in their classroom was good. From the findings provided, it is evident that the majority of educators do integrate computers in their classroom, which differs with the study by Bingimlas (2009: 238), which indicates that educators lacked the knowledge and skills to use computers and were not enthusiastic about the changes and integration of supplementary learning associated with bringing computers into teaching practices. The data on level of interest in using the computer indicated 95 percent response rate from educators revealing that they had a good level of interest in using computers. Meaning that the majority of educators were able to learn alongside their learners, and in doing so, they maintained a passion for their subject.

What were the challenges experienced by educators in implementing CAT in classrooms after participating in the INSET training programme?

The data on educator's reflection on training programmes indicates that the training programme caters for the professional growth of educators, as the initial training gained by them cannot equip them to cope with the complex; demanding and changing needs of education (see Chapter 1). Similarly, data on their reflection on the facilitation process of the training programme indicates that the majority of educators were satisfied. This means that through the facilitation process they acquired new and improved skills and knowledge that have enabled them to perform better; thereby, enhancing their level of productivity (see Chapter 2). When educators responded on

their reflection of learning infrastructure they indicated that the learning infrastructure was excellent. In this finding, it can be deducted that the majority of educators indicated that the learning infrastructure was suitable for the training programme.

The data on the question “In your opinion would you change anything about the training programme offered previously? If yes, motivate.” The finding indicates that the majority of educators were satisfied with the way that training programmes were offered, which means that they do not agree with researchers who found that there were still problems with the SA training model that was used (see Chapter 2).

They further indicated that training programs focused on enhancing their needs as CAT educators. This finding is in line with the literature in Chapter 2 that refers to training programme as a process of increasing human efficiency through which people are offered the opportunity to acquire new skills, and current knowledge required in carrying out tasks in their place of work.

In the question, “After attending training sessions did you still encounter challenges in your facilitation if no explain in the lines provided?” They indicated that the majority still felt the need for attending training sessions to eliminate the challenges they were encountering. This implies that the training facilitators should identify and address the challenges experienced by those educators. A study by Osunde and Omoruyi (2004: 406) concurs with these findings; the study states that the training and re-training of educators could enable them to cope with the ever-changing challenges of education (see Chapter 2). The response on whether the training programmes provided them with the required skills, which will assist them in improving their teaching and learning, with the option to indicate the reason if the answer was no. The finding indicated that, the majority of educators were satisfied with the skills they acquired from the training session. This is in line with Chapter 2 where it is indicated that training provides educators with the acquisition of knowledge and skills for a definite purpose.

The finding on educator responses regarding their opinion on the content of the training programme indicated the majority of educators are dissatisfied, the literature also suggests that for educator satisfaction, training has to be encouraged through on-going research, because the world is changing very quickly and new sets of skills are needed daily (see Chapter 2).

When questioned on their view on the duration of the training programme majority of educators are of the opinion that the training sessions should be prolonged. This finding is supported by the literature, which states that OBE itself was not the issue, but that the design of the curriculum and aspects associated with its implementation, such as the educator training, learning support materials, provincial support, and time frames, were the problem. Lastly, educators were requested to indicate their formal registration or possession of any qualification relevant to CAT learning area (if no they were required to explain in the lines provided). .The finding indicates that the majority of educators were suitably qualified to teach in this learning area as they are in possession of the relevant qualifications.

5.1.5 Conclusions

The conclusions for this chapter are discussed according to the research questions of the study.

- To identify challenges experienced by educators in facilitating CAT in their classrooms after participating in the INSET training programme.

The following challenging areas were identified by educators who attended INSET programmes:

They indicated that their training content was not relevant to the syllabus and that the duration of the training programme must be extended as they felt that there was a need to attend more sessions in order to equip them with the necessary knowledge and skills.

- To identify skills required by educators in order to improve teaching and learning after participating in the INSET training programme.

Educators indicated that they required skills on teaching learners with disabilities. When it came to the training programme, they indicated that they should be split in groups as to accommodate novices and advanced educators. This is because advanced educators normally feel like they do not benefit from the content training provided.

Thus, it can be concluded that this study answered the research questions, which were posed by the researcher. Furthermore, the study achieved its goal in assessing the impact of INSET programmes for CAT educators in the Motheo district, Free State Province, and it reveals that the programme still needs to improve on its content and relevance to the syllabus and provide educators with skills in dealing with learners who have disabilities.

5.1.6 Recommendations

The recommendations flow from the major findings of the study, which are as follows:

Training programme facilitators should improve the content for training programmes. They should identify suitable time frames for training sessions and its duration, and all this has to be communicated with educators before training is scheduled. Special needs education should be included for educators to be able to deal with learners who have disabilities. Lastly; educators should be provided with technical training (repairs of computers and printers) for efficiency in their classrooms.

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APPENDIX A

REQUEST TO CONDUCT RESEARCH

Central University of Technology, Free State

FACULTY OF HUMANITIES

Celebrating 30 Years of Technological Innovation
Soaring to 2020

Central University of Technology, FS
School of Teacher Education
Private Bag X20539
Bloemfontein
9300

2011/03/21

The Chief Education Specialist
Free State Department of Education
Private Bag x20565
Bloemfontein
9300

Dear Sir/ Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

Permission is hereby requested to conduct research in all secondary schools with the learning area of Computer Application Technology in the Free State province.

The title of the research project is “An impact assessment on in-service training programmes offered to CAT educators in Secondary Schools in the Free State Province“. This study is in fulfillment of the requirement for the Masters in Education degree at the Central University of Technology, Free State.

Thank you in advance.

Yours faithfully

J Bihi (Ms)

APPENDIX B

APPROVAL TO CONDUCT RESEARCH

education
Department of Education
FREE STATE PROVINCE

TO WHOM IT MAY CONCERN

This letter serves as confirmation that Ms J. Bihi is a Masters Degree student at Central University of Technology and has been given approval to distribute questionnaires in the workshop to be held for Computer Applications Technology educators. She would like you to participate in the survey she is doing in order to finish her studies.

Your cooperation and assistance will be highly appreciated in this regard.

Regards

Thandeka Mosholi
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Curriculum - FET Schools
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APPENDIX C

COVER LETTER FOR THE RESEARCH QUESTIONNAIRE

Central University of Technology, Free State

FACULTY OF HUMANITIES

Celebrating 30 Years of Technological Innovation
Soaring to 2020

Central University of Technology, FS
School of Teacher Education
Private Bag X20539
Bloemfontein
9300

REQUEST FOR COMPLETION OF RESEARCH QUESTIONNAIRE

Dear participant,

Please find the attached research questionnaire with the Title stated below:

The title of the research project is “An impact assessment on in-service training programmes offered to CAT educators in Secondary Schools in the Free State Province“. This study is in fulfillment of the requirement for the Masters in Education degree at the Central University of Technology, Free State.

It will be highly appreciated for you to complete the questionnaire in order for the study to be a success.

Thank you in advance.

Yours faithfully

J Bihi (Ms)

APPENDIX D

RESEARCH QUESTIONNAIRE

QUESTIONNAIRE

This questionnaire is on “An impact assessment on in-service training programmes offered to CAT educators in Secondary Schools in the Free State Province”.

1. This questionnaire is divided into 3 categories; you are kindly requested to respond to all the items in this questionnaire.
2. The instructions on how to respond to each item accompany the questionnaire.
3. Information gathered will be treated as highly confidential; therefore do not write your name or the name of the school on this questionnaire.

Category 1: Personal Information

(This category will focus on the following aspects listed below by ticking (√) next to the correct answer :).

1. Age
2. Teaching Experience
3. Experience Teaching with Computers
4. Total number of training sessions
5. Computer usage prior to training
6. Computer usage at home

1. What is you age? (Tick √ next to the correct answer)

20-30 years	
31-40 years	
41-50 years	
51and older	

2. How much teaching experience do you have? (Tick √ next to the correct answer)

1-5 years	
6-10 years	
11 and more	

3. How much experience do you have with computers? (Tick √ next to the correct answer)

1-5 years	
6-10 years	
11- and more	

4. What is the total number of training sessions attended? (Tick √ next to the correct answer)

1-5	
6-10	
11 and more	

5. Did you have computer usage prior to the training sessions? (Tick √ next to the correct answer)

YES	
NO	

6. Do you use a computer at home? (Tick √ next to the correct answer)

YES	
NO	

<u>Category 2</u>: Computer use levels (In this category the respondent will answer according to the following indicator levels: Poor and Good by ticking (√) next to the correct answer).

1. How do you rate your level of computer use?

Poor	
Good	

2. How do you measure your confidence with regard to computer use?

Poor	
Good	

3. What level of knowledge do you have with regard to using the computer?

Poor	
Good	

4. What is your level of integration with regard to computers in your classroom?

Poor	
Good	

5. What is your level of interest in using the computer?

Poor	
Good	

Category 3: Capacity Development Programs offered to Educators by the FSDoE

In this section the respondent will answer according to the following indicator levels by making a tick√ next to the correct answer in the blocks provided.

1. Excellent
2. Good
3. Poor
4. Not relevant

1. What is your reflection on the following (Tick √ next to the correct answer)

The training programmes?

1		2		3		4	

The facilitation process of the training programme?

1		2		3		4	

The learning infrastructure (venue)?

1		2		3		4	

2. In your opinion would you change anything about the training programmes offered previously? If yes, motivate.

……
……
……
……

3. Did the training programmes focus on enhancing your needs as a CAT Educator?

YES		NO	

(If no explain in the lines provided)

……
……
……
……

4. After attending training sessions did you still encounter challenges in your facilitation?

YES		NO	

(If no explain in the lines provided)

……
……

……
……

5. Did the training sessions provide you with the required skill which will assist you in improving your teaching and learning?

YES		NO	

(If no indicate in the rows below on the skills you require to improve your teaching and learning)

……
……
……
……

6. Give your opinion with regard to the content of the training program?

……
……
……
……

7. What is your view on the duration of the training programme?

……
……
……
……

8. Are you formally registered or in possession of any qualification relevant to the CAT learning area.

YES		NO	

(If no explain in the lines provided)

……
……
……

9. OTHER COMMENTS

……
……
……

THANK YOU FOR YOUR CO-OPERATION IN COMPLETING THIS QUESTIONNAIRE