AN INVESTIGATION INTO THE USE OF COMPUTER – BASED TECHNOLOGY IN SCHOOLS AROUND MANKWENG DISTRICT, LIMPOPO PROVINCE

BY

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Declaration

"I declare that the dissertation hereby submitted to the University of Limpopo (Edupark) for the degree of Masters in Development (MDev) is the result of my own work**.** All the sources that I have used have been acknowledged by means of complete references."

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Signature **Date**

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Abstract

The purpose of this study is to share with the scholars, various institutions, government, particularly the teachers in Mankweng, on the use of computer-based technology in schools around Mankweng District. The study looks into issues such as computers in schools, computers in teaching, negative aspects on computer usage and policy in schooling context.

The study further provides information on the assessment, values and ethics for computer-based technology use, elimination of reluctance in using computers, teachers' resistance attitude considering the infusion of computers, which is globally an issue of concern, is also being highlighted. The background on the curriculum change, from traditional ways of teaching to the development of the new curriculum (OBE),is advocated briefly and to the point. There is also data analysis, interpretation and presentation and the summary of findings, conclusion and recommendations.

It was against this background that a study of this nature was undertaken. The main two-fold aim was to investigate the impact of computer-based technology in teaching and the interaction between the teacher and the computer. There is a tendency among teachers to ignore the use of computers. However, not all teachers ignore the use of computers. The study was conducted at the Mankweng Circuit of the Limpopo Province. A questionnaire was used as an instrument to collect data. The results indicated that most teachers have insufficient training, fear losing authority and have misconceptions, which are the main reasons of not using these technologies. Therefore, continuous training and ongoing support will help to keep abreast in preparing learners for the work place.

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Background of the study

1.1. Introduction

The current era has been characterised by shift room from an industrial society to an information seeking society. A revolution of information and communication is taking place in the world with individuals, schools an organisations becoming more and more interconnected through computers and online system like the Internet (Hodge & Miller, 1997:33). In spite of their widespread use, most people are still unfamiliar with how computers work, what task they could be used for in future.

The dawn of the new democracy in South Africa in 1994 has opened doors for many disadvantaged communities. More schools are getting connected with computer-based technology, which they either buy or receive in the form of donations. The installation of computers in schools is intended to benefit both teachers and learners. Technology has a positive effect on the school as it allows staff to do its work efficiently and in the minimum amount of time. Communication with other schools is also made easier and quicker. Teachers and learners are able to collaborate and share information with scientists, professors and even eyewitnesses (Schrum & Berenfeld, 1997:42).

1.2. Statement of the problem

Though computer literacy is a pre-requisite for employment in most professions, many teachers still do not know how to operate computers or use them for teaching purposes. Subsequently, the schools send for training to keep abreast of new developments and technology. The general tendency of enthusiasm and excitement of learning by teachers during workshops and seminar on how to use computers as teaching tools has been noticed. However, the problem is when they return to their school they find it difficult to change the way they routinely run their classroom and to implement the new technological ideas they have learned. As a result, these teachers get frustrated with the whole training experience.

Anger and anxiety develop when they have to use computer technology as a teaching aid. They are compelled to resort to the traditional and familiar methods of teaching. Some schools within Mankweng Circuit have formed clusters to workshop each on how to collaborate and share resources, and to enrich the authenticity of the learning environment. However in many schools the equipment remain unused, as teachers are afraid to use it or have inadequate opportunities for training an poor access to technology, strategy for implementation are thus often flawed. There is a tendency among teachers to give up as soon as they find-out the hard work involved in planning their work using the computers. As a result, they resort to the old and familiar strategy of planning, preparation and teaching.

This study investigates whether or not teachers attached to schools based in the rural areas around Mankweng Circuit are fully equipped to utilise the computer-based technology transformed teaching.

5.3. Motivation for the study

The newest, most talked about, and most highly sought after technology for education is the computer. Computers are most active form of educational technology in the school today. Teachers are the key individuals in the successful implementation of computer programmes in schools. Unfortunately some teachers are ignorant of global changes and are uncomfortable about change because they do not understand their new role. Very little research has been done about the usage of computers in Limpopo Province.

In conducting this study, the researcher was motivated by the need to enquire about the manner in which computers are being used, what computers are being used for and factors that can be regarded as enabling or hindering the use of computers.

5.4.Aims

The aims of the study were namely:

- To investigate the impact of computer-based technology in teaching; and
- To investigate the interaction between the teacher and the computer.

5.5.Objectives

The main objectives of this study were namely:

- To investigate the nature and extent of computer provision in schools;
- To find out about the task performed by computers; and
- To identify and differentiate among the various types of computers used in teaching.

5.6.Research Methodology

Leedy (1997: 104) defines methodology as " merely an operational framework within which data is placed so that the meaning may be seen clearly". Methodology is "the design of study, including the logical arrangements, sampling and data collection procedures, and the measurements approach" (Rubbie & Babbie: 1997:98). The aim of methodology is to help to understand, in the broadest possible terms, not the products of scientific inquiry but the process itself. The study is quantitative, as it seeks to derive categories from the data in order that it can be compared, that is words and phrases are transformed into numbers. The importance of quantitative data is that it is measurable. Answers to the research questions will lead to the scientifically based suggestions regarding the usage of computers.

Quantitative research is concerned with information, which can be measurable and standardized, and it considers data, which can be simplified into categories. (McMillan & Schumacher 1993:373). It further reproduces the meanings of participants in the first instance, as oppose to subjecting them to critical analysis in terms of their political or social context of their production. It is, therefore, assumed that this methodology will enable an in-depth investigation into teacher's perception on computer usage.

1.6.Research Questions

The study raised the following research questions:

i) How does the lack of training reduce confidence and increase anxiety in computer used by teachers?

ii) What improvements can teachers and learners experience when using computer-based technology in learning process?

iii) What is the significant difference of understanding information technology gives, before and after the training of teachers in computer use?

5.7.Area of Study

The study was confined to the Mankweng Circuit in the Limpopo Province of South Africa. Mankweng Circuit lies about 30 kilometres East of Polokwane. It is one of the six circuits found in the Mankweng Area Office, which is divided by the Department of Education for management purposes. The offices of the Department of Education are found in the Mankweng Township.

Mankweng is a town with a population of about plus/minus 50 000. Most people are unemployed. In most schools, resources are limited and budgets are tight, as parents do not contribute school fees. Few schools are equipped with computer-based technology. The research project was confined only those schools that uses computers as learning and teaching tool. The Mankweng Circuit was chosen because most of its schools have recently started using computers as a teaching tool.

5.8.Population and Sampling

According to Babbie (1992:98), population refers to the theoretically specified aggregation of study elements. Bless and Higson-Smith (2000:12) refer to the population, as “a set of elements that the researcher focuses upon, to which the results obtained by testing the sample should be organized”.

Given the fact that the target population for the research is scattered over a large area, purposive sampling method was used to select fifty teachers from five schools that have access to the usage of computers-based technology but are not used during teaching and learning for inclusion in the study. A sample of ten teachers aged 25 to 50 years was selected from each school for inclusion in the study. Purposive sampling was used because it allows the researcher to handpick subjects on the basis of specific characteristics.

Purposive sampling method was selected because the population chosen was likely to be knowledgeable and informative about the phenomenon the researcher is investigating. The advantage of purposive sampling is that it ensures the balance of group sizes when multiple groups are to be selected.

1.10. Data Collection Techniques

The researcher used a closed-ended questionnaire as the data collection instrument. A closed-ended questionnaire was used as it provided a greater uniformity of responses and it is more easily processed. The questionnaire was self-administered by the researcher. The researcher intervened where clarification was needed. The advantages of self-administered questionnaires are "economy, speed, lack of interviewer bias, and the possibility of anonymity and privacy to encourage candid responses on sensitive issues" (Neuman, 1997:79).

1.11. Data Analysis

The data collected in this study through questionnaire were analysed and the results are presented using a statistical package. Statistical tables are drawn to describe the data clearly, to identify what was typical and atypical among the data and to answer research questions. The analysis is based on the availability of the computers at school, training received by teachers and teacher's attitude towards computers for the purpose of making teaching more effective.

1.12 Limitations of the study

1.12.1.The major limitation was the restricted access to the participants' biography in cases where they would not want to disclose their educational qualifications. The research focused on the teachers` computer technology-related activities and the teacher's assessment of students` performance. Emphasis was placed on computer-based tools because of their dynamic, quick evolution and their organizational impact. The problems that were encountered include those of missing data and unanswered questions.

The question of time, particularly in obtaining permission from the Head of Department and from the Area Office, was another limitation. It took the researcher six weeks before the questionnaire could be completed. The researcher gave the respondents a week to complete the questionnaire but in some schools it took them two weeks, as there was lack of cooperation from some teachers.

The third limitation encountered was that some questionnaires were incompletely filled out. Some of the respondents answered questions in the first two pages and did not give responses to the remainder of the questionnaire. Not all questionnaires were returned. From a total of fifty questionnaires issued, only forty-five were returned. The questionnaires could not be traced as teachers claimed to have returned them. However, with the questionnaires received, the researcher found them to be informative and valid enough for analysis.

The last limitation of this study is that the results cannot be generalized to the total population of other geographical areas in the region and province as the study highlighted a few matters concerning the use of computers for effective teaching. It is, therefore recommended that further research be conducted to investigate those areas that are not covered by this investigation such as schools without computers, lack of infrastructure such as electricity and computer laboratories. Recommendations made from this study should be used to help improve the effective usage of computers in this complex, interconnected and dynamic world.

1.13. Ethical consideration

1.13.1.The researcher was present in order to explain what was expected of the respondents and how to fill in the questionnaire. Liaison was established with the principals of the schools to incur more support and to ensure that all the questionnaires were promptly responded to and returned to the researcher. The researcher informed the respondents that the results of the survey would also be made available to them.

1.13.2.In order to have access to the school, permission was obtained from the head of department in the head office. The area manager and the principals of the schools concerned were also informed. The head of department (HOD) requested the final product of the dissertation. The selection of schools was made out of schools using computers in their teaching. The administration of the questionnaire was mainly the responsibility of the researcher.

1.14. Definition of concepts

1.14.1. Computer

Kinkoph et al., (1994:7) define a computer as an electronic machine that enables a user to input, manipulate, store and output information. In this study, computer is regarded as an instrument that supports teaching and learning.

1.14.2. Technology

This concept is used to include print, computers, videocassettes, radio, broadcasting that can be used in distance learning applications like lectures, and programmes, video conferencing and computer aided learning. The concept is further used to mean other electronic media devices that can help to meet the instructional and productivity needs of public education.

1.14.3 Teaching

Papo (1994:20) defines teaching as "the provision of opportunities to learn and it is an interactive process as well as an intentional activity". In this work the concept is used to mean to engage learners to experiment, to be creative and be able to express themselves.

1.14.4 Learning

Bendeich (1988:74) defines learning as a process of acquiring knowledge, attitudes, or skills from study, instruction, or experience. In this study, it refers to process of practising, repeating and rehearsing using the computer.

1.14.5 Internet

Kibby (1990:32) describes internet as the way a computer operates to let other users call and access them all over the world. In this work, it refers to an alternative mode of delivery of information, which is the source of open, distance peer and mentoring, on and off campus learning.

1.14.6 Computer Communications

Ely (1993:165) defines it as a process by which computers communicate with each other via modems, telecommunications software, and existing telephone lines. In this study, the concept means to share and exchange data with other computer users almost anywhere in the world.

Chapter 2

Literature Review

2.1. Introduction

Our world continues to become increasingly more complex, interconnected, and dynamic. There are more people and institutions. They are engaged in more relationships and exchange information, and the rate of change continues to grow. The development of information technology has changed the world. In all countries, whether developed or developing, educational policy makers are faced with a major issue, namely, how to create better chances of success for all children. Rapid advances in computer technology have made the use of computers as a classroom tool more affordable. The integration of computers into the school curriculum has received much attention in recent years. Teachers are still using the traditional methods of instruction at the exclusion of computer-assisted instruction. Teachers need to be effective and knowledgeable as computers and information technology are a critically important part of the commercial, financial and industrial environment.

2.2. Effective Teaching through Computers

It is not easy to get a clear definition of teaching. If teaching is defined as involving giving lessons in a didactic situation (teaching and learning situation), then learning is necessarily passive (Papo, 1997:15). It is obvious that nowadays, knowledge has become the key to the economic development of the developing and developed countries. For learners who will live in the twenty-first century, this pedagogy is functional. According to Zehr (1998:21), learners who cannot think, solve problems and be able to handle information will be destined to seek employment in the shrinking pool of unskilled jobs. Van der Horst & Mcdonald (1997:44) state that, in South Africa, the change implemented since 1994 has included the development of a new curriculum framework for learning and teaching. Outcome-Based Education (OBE) model is being implemented in schools through Curriculum 2008.

This framework seeks to change some of the traditional approaches of teaching and to meet the needs and challenges the world is facing (Bengu, 1997:2). Because it challenges traditional ways of teaching, the implementation of Curriculum 2008 is complex and highly contested. It has important implications for defining the teaching and learning framework in which computer-based technology will be used. According Van der Horst & McDonald (1997:79), in OBE the learner is not a passive recipient of knowledge, but an active participant in participant in the teaching and learning process. In OBE, the focus is on the leaner. There is acknowledgement that learners are unique and can learn in different ways. Traditionally, learners were passive listeners and learning according to the teacher's pace. The emphasis was on what the teacher wants to achieve rather than on what the learner can achieve at the end of the learning programme. Bengu (1997:2) further says OBE invites learners to think critically about what is being offered to them, to question the existing knowledge and to question answers rather that merely answering questions.

The following are the general shifts envisaged through the new curriculum:

- From content-based to outcome-based education;
- From passive to active learners;
- From examination-driven to ongoing assessment;
- From rote learning to critical thinking, reasoning, reflection and action; and
- From textbook bound, teacher-centred education to learner- centred education, where the teacher is a facilitator of the learning environment.

From the points listed above, teaching should be more than simply giving the learners direction. Teachers facilitate learners to develop basic skills to become life long learners, problem solvers, and productive team workers (Van der Horst & Mcdonald, 1997:44). Effective teaching is essentially concerned with how best to bring about the desired learning by some educational activity (Vance, 1993:2). The quality of the teacher-performance in the classroom is partially due to academic capacity, an indicator that many studies rely on for their conclusion about effective teaching.

Jonassen (1995:70) indicates that recent curriculum development is beginning to suggest ways in which computer- based technology can be integrated in to form part of teaching and assessment. For example in the senior phase of schooling, provision is made for a language, literacy and communication programme (Zehr, 1998:43). Similarly, at the foundation and intermediate phase, there are explicit signals about the need for learners to access information beyond books and texts. The key challenge is to translate these into action for promoting Information Communication Technologies (ICTs) in education.

The introduction of computers into education is essential to prepare learners for the economic and social realities of today and what they will face in the year 2020.Vance (1993:29) says a global approach to this introduction, which includes developing appropriate teaching and learning strategies interwoven with, and based on the capabilities of technology should be a goal. To be truly effective, technology introduction must be an ongoing, dynamic effort at every stage of the educational process (Johnston & Johnston, 1996: 14).

2.3 Computer in Schools

The information age has clearly arrived. Some writers use these words to describe innovations, "information highway and cyber worlds, multimedia at the electronic newsstand, the virtual classroom, and learning in the digital future". These catch phrases and terms that are hallmarks for the multi-media euphoria, which is starting to emerge. Dieter (1996:2) further points out that "we are setting off on journey towards organised chaos, using computers as a means of travel". The future is ambiguous for today's children in the rapidly changing world. The speed and uncertainty of this change makes it impossible to predict, with any precision, what skills students need to function as adults (Rotem, 1998:23). The need for students to be able to cope with daily problems in a dynamic world has led many educators to conclude that technology integration in education will enrich the learning environment in schools. It is obvious that technology has brought about widespread and fundamental changes in education. Therefore, major developments in the use of technology must take place in schools.

According to Male (1997:16) the growth of computer usage in education is a global phenomenon. Countries in both developed and developing worlds have expressed vision of participating in, and shaping the global information society. Invariably these visions emphasise education as a primary way for computers to produce competent learners, suitably qualified and skilled to contribute to economic growth. Zanker (2000: 45) further points that computers are a fact, a way of life and that societies, countries and individuals need to be familiar with and work with computers in order to avoid being "left out". In education, it translates into a call for all learners to be familiar with computers. The failure to achieve this is understood as leaving learners ill-equipped for the modern world. The effective integration of computers in a learning environment depends on the way computers are situated within that larger cultural milieu. As computer and other information technologies enter the socio cultural setting of the school, it "weaves itself into the leaning in many more ways than its original promoters could possibly have anticipated" (Papert, 1993: 53). Most countries espouse the role and value of computers in education.

Issues such as redefining the curriculum, new styles of teaching, empowering individualized learning and moving beyond the idea of a fixed location school, are often discussed as if both the ideas and the power of computers to deliver them are inconsistable. According to Marshall & Ruohonen (1997:16), developing countries who have been using the computers in education for a number of years, suggest that the relationship between computers and learning at all levels is complex and fragile.

Newby (1996:20) illustrated that the computer power within education revolves around its versatility as both a production tool and presentation tool. He further argues that computers for teachers and learners have the potential to:

- Enhance the quality of instructional materials using the electronic capabilities of the computer;
- Reduce the time required to design, produce and reproduce instructional materials;
- Combine graphics, video, audio, and textual forms of media into a single integrated instructional presentation; and
- Increase the overall effectiveness of instructional materials through enhanced presentations.

It is expected that "an educated citizen in the year 2020 will be more valuable as an employee because he/she will be able to produce more builders, synthesizers and investors of strategy that are valuable as an employee who manages facts" (Hamza & Alhalabi, 1999:10). Computers have revolutionalized the education process by providing quicker learning, better comprehension, and increased recall in selected studies. Newby (1996:20) sees the emergence of computers as connected to the transformation occurring in the knowledge domain and the world of production. Computers are intrinsic component of knowledge societies. Most schools in the country have done little to have computers to the core of their programmes. Even today, widespread application of multimedia technology in education has not occurred because of the failure to adapt to the technology. For true success, computer aided education must do more than mimic textbooks (Hamza & Alhalabi, 1999: 12). It must provide an immense environment for multidimensional learning that is also uniquely enjoyable and stimulating. This requires enhancing the multimedia capabilities of the computer. With multimedia capabilities, textbooks become dancing characters, beautiful graphics and animated cartoons, movies with sounds.

As Schrum & Berenfeld (1997:26) put it, "connecting our classroom can make the education process available to everyone regardless of geographical or socio-economic circumstances. It enables communities of learners to collaborate and share resources, and can enrich the authenticity of the learning environment by providing students with access to scientists, professors, astronauts, and eyewitnesses"

Schum & Berenfeld (1997: 29) further state that if classrooms are connected, they are able to:

- Provide learners with an effective model for lifelong learning.

When learners research using computers, apply credibility tests to assess what they find, and learn telecommunication, techniques such as World Wide Web (www), publishing, they develop skills that are increasingly important in today's society.

- Bolster social, communication, and critical-thinking skills.

Students can enhance their communication; social and collaborative skills as they interact and learn with their peers and online mentors. They also develop critical thinking skills when collaboratively analysing and solving problems.

- Increase the authentic of learning environment.

By directing students to access such resources as rare historical archives, eyewitnesses report or digital museum, teachers increase the authenticity of the learning environment.

Male (1997:140) thinks that the environment in which computers are used are characterised by the following:

- Students learn by doing, as active creators and constructors of knowledge,
- A student learns to analyse and solve problems and communicates clearly through different means and in collaboration with others, rather than in isolation,
- Students transform and use prior knowledge, and
- Students learn in a highly supportive environment, with changed roles for teachers and peers.

The classroom organisation, and particularly the computer room, should allow for independent an autonomous work as well as for group work and cooperative learning, which even young children are capable of assuming by themselves. Learners develop their own methods of work, share their experience and become more an more efficient as a variety of settings are provided, and learners can cooperate with one another as they work, that enhances learning (Marshall & Ruohonen, 1998: 158).

Rotem (1998: 45) states that this ability to communicate rapidly and easily, over large distances, gives rise to a ‘virtual community’ surrounding an individual with a world that we experience literally through our computers, which have changed the world so we do not experience it.

By sharing and collaborating resources over long distances, schools can realise the following factors as stated by Hill (1997: 76):

- accessibility and convenience;
- enthusiasm over a new interest;
- time and cost effective for the students;
- the existential need to be in the front line of progress;
- the immediate updating possibilities for hi-tech workers; and
- the new way in which the internet enables creation of new information and reference to existing information.

The hindering factors are mainly the influx of information, the expertise required of teachers, and large development and maintenance budgets. Jonassen (1996: 67) further says that computer tools mediate or alter the nature of human activity and, when internalised, influence humans' mental development. Following this perspective, the use of technology in schools is a reflection of what is currently considered to be meaningful learning activity in the community.

2.4. Computers in Teaching

In a context of global transformation, in which the education sector is experiencing its fair share of the pressure to change, it is uncommon for educational technology to be viewed as a solution to crisis in education (Chaptal, 1998: 134). As Haggis (1995:1) puts it, a computer is only a tool and educational choices have to be made first in terms of objectives, methodologies and roles of teachers and learners, before decisions on the appropriate technologies can be made. Haggis (1995:1) further argues that no technology can fix bad educational philosophy and practice. The challenge is to rethink learning objectives and to align the learning technologies with these objectives.

According to Johansen (1999:55) traditionally, technology is used to promote `drill and practice` type of exercises, to teach technology itself, to introduce new subjects like computer studies, to teach basic computer skills like word processing. More recently, technology has been used to promote student-centred learning through greater emphasis on project and teamwork.

Computers become integrated into the curriculum so that students acquire new communication skills at the same time as learning about a knowledge domain. Student-centred learning does not alleviate teacher workloads. Teachers are still responsible for designing learning programmes that deliver content and enable the acquisition of competencies an, in addition, their role expands to include facilitation, guidance and the instilling of awareness in students of their own learning patterns (Alexander, 1999: 9). With learners` needs and instructional objectives stated in behavioural terms, instructional designers and teachers must concern themselves with the selection of appropriate strategies to teach the required skills (Moore, 1990:10).

Such selection of lesson delivery strategy is crucial to the effective leaning. Also, the use of relevant instructional technology is paramount. According to Johnston & Johnston (1996:66), technology can enhance these methods as well as by motivating learners and assessing their progress. Any method that embraces the view of technology as a facilitator of thinking and knowledge construction must be developed. In the teaching-learning process, Johansen (1999:35) states that the most meaningful and productive use of technology engages learners in:

- knowledge construction;
- articulation;
- collaboration; and
- reflection

Our view of technology expands the more we utilize the technology of instruction for planning and delivery of our instructional strategies. The multidimensional role of technological capabilities is what will enable its potential to be harnessed (Johnston & Johnston, 1996:34). In integrating computers in teaching, Johansen (1999:45) suggests the following helpful ways:

- ensure that the programmes are dealing with real world problems and that their projects are as realistic as possible;
- ensure that there is sufficient time for playing with the technology as part of the learning experience,
- ensure that students have the necessary skills that allow them to use the information to which they have access efficiently and effectively;
- ensure that learners are involved in decision-making;
- ensure that there is systematic assessment throughout the project; and

- ensure that teachers are helping learners to become conscious of the content they are learning.

When using the above-named helpful ways, the emphasis should be on learning the content rather than the technology, although technological dimension should add an element of pleasure to learners. As Salomon (1996:123) points out, in light of the doubtful level of added value provided thus far by computer-based technology approaches to learning and instructional process, new pedagogical concepts need to be defined in order to maximise computer technology utilization.

Melamed (2000:4) summed up Salomon's observations by suggesting that, for the maximization of computer-based technology utilization in schools, the following should be done:

2.4.1 Knowledge and skills

According to Joyce and Weil (1980:6), all students should be skills, such as use of software packages that include word processing, use of e-mail, use of Internet search engines browsers, and use of software related to computer technology. In addition students will be taught necessary use of skills for the use of Internet -based databases, knowledge identification, knowledge utilization, knowledge assessment, knowledge organization, use of interactive technology based on communications, use of Internet-based forums and chartrooms and the use of a variety of distance learning approaches designed to promote self learning.

Moore (1990:6) further says that students will be encouraged to conduct individualized research projects while using advanced computer technology approaches and methods. Such information-rich learning environment and communication technology will enable them to review relevant databases and utilized digital libraries in the search of relevant information.

2.4.2. Development of autonomous learner

In an era when rich and varied information is freely available through the medium of computer technologies, schools cannot continue in their traditional role as major providers of information and knowledge to learners (Moore, 1990:46). Learners must be trained as autonomous learners to be able to relatively search computer-technology based knowledge reservoirs and to understand and absorb electronically available information. Thus, a flexible classroom in which a learner is able to decide how to navigate the computer – technology based learning environment in order to achieve his or her learning goals is of paramount importance. Teachers will need to be trained in the art of learning goals. Technology literacy, utilization of time, individualized learning, mastery and collaborative learning are just few of the major skills that learners will need in the computer-based technology learning environment (Newby: 1996:22).

2.4.3. Values and ethics education for Computer-Technology Use

The use of computer-technology approaches, in particular learning instruction process, provides both students and teachers with insight as to how freedom of speech, choice and access are of major importance in the ICT-based learning environment (Yablon & Katz, 2001:21). Students and teachers must be made aware of the potential dangers that are present in the future of ICT learning environment. Whitaker (1993:17) says that concerted efforts must be expanded in order to train student and teachers in the art of values and ethics of ICT use, in order to utilize the advantages of technology without becoming involved in the shady side associated with ICT utilization.

2.4.4. Social aspects of ICT use

Schools have traditionally complemented the home in the socialization process. Thus the traditional classroom provided convenient opportunities for furthering the socialization of students. The use of advanced computer-based technology approaches in the learning and instructional processes must be modified to further the social goals of educational system (Krynacou 1986:145).

Students should be able to develop their affinity to the community through the use of computer-technology in the educational situation. Inter-school projects in which students studying at different schools, and originating from different population groupings can join in common educational projects that lead to better understanding, cooperation and tolerance within greater community (confirmed by Yablon & Katz 2001:180), should be encouraged to use computer-based technology approaches. In addition, collaborative inter-school use of advanced computer-technologies can narrow the digital gap that also contributes positively to the building of a robust social community structure.

2.4.5.Schools-based pedagogic support

The assimilation of the use of computer-technology based environment in the educational process must primarily be done in the school. Thus, expect computer-technology educational consultants must be available for consultation and the provision of advice to school principals, teachers, and other educational personnel within the school framework (Moore, 1990: 47).

2.4.6.Assessment

The implementation of advanced ICT educational approaches in the educational system is a major change in the conceptualisation of learning and instruction. Thus, the implementation process must be closely assessed in order to prevent prolifiration of superfluous and unwanted educational mistakes that can easily accompany the assimilation process.

According to Gawe & Jacobs (1996:107) assessment needs to be conducted in order to ensure:

- Pedagogies quality of the computer-technology penetration into the school classroom;
- The smooth transfer of knowledge from more traditional approaches to the computer-technology approaches;
- The correct rate of implementation, taking into consideration the skills and limitations of teachers and students; and
- The success of the implementation process.

Only if objective assessment is conducted will a school be able to monitor the implementation process in a controlled fashion that will in turn promote more effective computer use in learning and teaching.

2.5. Computers and Teachers

Many teachers enjoy the thrill of change and welcome an innovation on the potential merits. The teacher plays an important role when the computer is implemented into the classroom curriculum. Katz (2000:13) says the success of the implementation of advanced and sophisticated computer approaches in the teaching and instructional processes are dependent mainly on teacher computer competence. Teachers must be with relevant advanced Internet and distance leaning tools. According to Yablon & Katz (2000:76), in many developing countries of Africa, particularly southern part of Africa, teachers` working morale is low in recent years, while technological advances and modern educational reforms require teachers to have knowledge, skills, confidence and resources increased.

In the present circumstances teachers are faced with such problems as to how to:

- Integrate new technologies into teaching and learning;
- Understanding the relationship between technology and learning matter;
- Have access to the technological equipment; and
- Have training and resources that will result in enriched learning and attitudes.

Demands on teachers and teaching environments are increasing because of exceptional students with special needs, handicapped students, students from different cultural and language groups, students from single-parent families, and students from poor economically depressed environments (UNESCO/UNICEF, 2000:34). This means that teachers must employ a wide range of teaching skills and methods in order to reach and motivate these learners. In building the information society, especially within the education field, an essential shift in perspective and even change in all activities from the teaching-centred approach to active learning is in progress. There is a role for teachers of today to be able to further that process and guide the “learning to learn process for the students”(Johnston & Johnston, 1996:98). An important goal for all professionals is competence in their job.

According to Zanker (2000:27), teachers seem to have totally accepted the rationale for using computers in the school, realizing that technology slowly but steadily finds its way into the educational setting. Papert (1993:23), in a study of student performance and teacher behaviour, concluded that success, usefulness and effectiveness of technology would depend upon the instructor's skill and choosing the appropriate hardware and software. Molenda & Russell (1996:28) contend that the usefulness and effectiveness of the technology will depend heavily on an instructor's competence in applying the technology. Computers have transformed the teacher into the role of a "guide or supervisor", leading learners to discover information for themselves, rather than the learners being the passive recipients of information obtained from the teacher.

Steen (1997:194) states that in order to be effective in using computers to support teaching and learning, teachers need to:

- Be skilled as proficient and discerning users, not as technicians;
- Know how the use of resources can be built into education, and not onto education; and
- Know how to use the resources, not how the resources work.

Computers allow teachers to interact in some fashion with a much greater variety of people than they could ever hope to reach without. It is in this communication through the trading of ideas and understandings, that teachers have the opportunity to check their own understanding against that of others and to refine and reflect on their growing ideas about the way the world works. Betram et al., (2001:213) further state that computers as a source of information can be used to exposed teachers and learners to topics and experiences beyond the classroom walls. Many people have argued that computers will replace teachers in the classrooms because they can provide access to so much more information than any ordinary teacher can ever know. They can also be programmed to respond to every individual learner's answers, so their teaching is also superior. However, they are unlikely to replace good teachers.

In building the information society, especially within the educational field, an essential shift in perspective and even change in all activities from the teaching-centred approach to active learning should be in progress.

To implement the principles of lifelong learning, a teacher's professional skills are essential. Teachers need not only to know how to manage and communicate information in their own field, they must be able to teach the methods of obtaining and using information to enable students to learn to work independently. Teachers should further have the opportunity and the skills needed to use the media that are necessary for open and flexible learning, and be able to modify and develop material in ways that make it suitable for them to use.

Yablon & Katz (2001:67) state that the success of the implementation of advanced and sophisticated computer approaches in the learning and instructional process is dependent mainly on a teacher's computer competence and the teacher must be able to:

- Initiate computer-based projects suited to the individual needs of all students, to promote the use of electronic and digital databases;
- Assess student's outputs and to examine ways and means of increasing learning effectiveness on the basis of these assessments;
- Establish teacher task groups that will prepare learning materials suited to computer-based individualised student learning and research projects, and
- Become familiar with computer-friendly pedagogic methodologies, such as collaborative learning, cooperative learning, small groups learning methods, and individualized learning.

Gersert & Futrell (1995:11) further add the following points to the teachers who use computers:

- A computer-using teacher is one who makes use of a computer to help students learn. This may happen in a very direct manner (by having the computer doing some teaching, for example, or by using a computer to manage students learning), or indirectly (such as using a microcomputer and word processing program to prepare tests and work-sheets for the next day's activities);
- A computer-using teacher must be able to integrate a computer into an existing curriculum, judging when it will do a task well and matching the computer's capabilities with the instructional programme for which the teacher is responsible, and

- The goals of a computer-using teacher should not be able to teach about computers, or to teach computer-related curriculum, the computer itself is more of a teaching partner than an object of study. Computers play a role in instruction similar to that of other media such as overhead projectors, textbooks, or films.

A computer is important to the degree that it contributes to the teaching and learning process. For the computer-using teacher, the microcomputer is a means for reaching ongoing instruction.

2.6. Negative aspects on computer usage

The purpose of using computers is to make teaching easier and more effective. Teaching is improved if learners are able to perceive what is being taught. According to Kozma (1992:179), computers and their programme selections and utilisation processes directly impact what the learner perceives and how information is retained and recalled. Azarmsa (1998:138) says computers in themselves do not posses any disadvantages; it is only wrong perceptions that may lead to their ineffectiveness. There are principal negative factors that prevent schools from using computers as a tool for teaching, such as the following:

2.6.1. Insufficient Funds

Chaptal (1997:218) indicates that one of the negative aspects of using computers in teaching is finance. As Azarmsa (1998:138) puts it, the reasons for implementing computer network are sometimes overwhelmed by the cost and problems associated with its maintenance and use. Most schools are in the disadvantaged communities and the reality is that these schools want to be connected, but schools might find it difficult to invest in computer-based technology, to fit high-quality programmes, maintenance and technological infrastructure, especially in these times of economic hardships.

2.6.2. Computers can be confused with entertainment

According to Bendeich (1998:2), the main aim of teaching using computers is to bring the world to the classroom. As Schrum and Berenfeld (1997:26) put it, “connecting our classrooms can make the educational process available to everyone regardless of geographical or socio-economic circumstances. Unfortunately, some teachers regard computers as form of entertainment, and not used during teaching and learning process. It is often regarded as affording relaxation in the middle of the ordinary lesson. Even the best teachers in the world find it difficult to be in their best all the time. Thoughtful integration of appropriate computer-based learning, however can take some of this pressure off teachers, enabling them to offer, on their own account as well as with the help of the computer, consistently excellent learning experiences in their classrooms (Poole, 1997:13). In spite of this misrepresentation, computers should never be used as an optional extra lesson, or as a substitute for the teacher.

2.6.3. Computers can undermine personal contact

In self-learning situations the role of the teacher must change. Although the use of computers cannot be over emphasized, teaching is effective when there is direct observation in a classroom. The live lessons where teachers facilitate, encourage students to experiment, to raise questions, to take risks, and also functioning as an audience who models a critical thinking paradigm, who asks for clarification, can never be underestimated. Chaptal (1998:22) suggests that computers should not act as substituted for teachers, but should supplement the teaching and learning process. Learning may not benefit meaningfully if teachers make incorrect application as they may lead to impersonal situations.

2.6.4. Computers can create misconceptions

The usefulness of teaching and learning using computers is still questioned by some teachers. As Burkeley (1988: 29) puts it, “multitudes of teachers have attended seminars, workshops, conferences and even semester long courses, where they have had the opportunity to learn how to use computer-based technology as a teaching and learning tool.

However, they return to their schools only to have that enthusiasm and excitement wane as reality is brought to them of the extent to which they would have to change the way they have routinely run their classroom. The transition of ideas, and enthusiasm about those ideas, into practical implementation is often difficult. Freysen (1989:25) supports by mentioning that computers are available in schools but there are still teachers who consider themselves the only medium. They feel scared and threatened that computers will replace them. There is also a lack of clear guidance and guidelines according to which computer programmes should be chosen. Computer programmes are still selected haphazardly on the basis of what is available. According to Gawe and Jacobs (1996:240), computers that contain technical inaccuracies may easily create misconceptions in the learner if the specific learning opportunities are not correctly handled.

Technology- based teaching provides teachers with the opportunity to find new ways of helping learners to learn and achieve. The ultimate challenge for teachers is selection and design of performance tasks that meet the overall and specific grade level expectations of the school curriculum (Hill, 2000:8). While doing so, the teacher is cognizant that the software will provide students with the opportunity to engage and discover lifelong learning skills, and generate high-level ideas on issues in a manner that would have been the case through lecturing and pen and paper learning.

2.7. Teachers resistance attitude considering the infusion of computers

Despite substantial resource provision and a number of national and regional strategies, the impact of computers in education is still relatively small. There is an apparent resistance by teachers to use the computers within the normal pedagogy classroom. The confusion of purpose about the role of computers in schools is part of the problem. But more significantly a complex intertwining of the techno centric focus associated with computers real barriers to change and professional unease fuels teachers' reluctance (Mooij & Smeets, 2001:7).

Many teachers are uncommitted about the use of computers. As Steen (1997:34) points out, teachers stated that in-service education or ongoing staff development explicitly directed at change, has failed in most cases because it is ad hoc, confidence in the role and use of the recourses. This poor experience coloured their willingness to explore further, even the means close at hand.

Geisert (1990:15) says teachers teach the way they were taught. The typical classroom is organised around the concept of one teacher and a group of students, with the teacher at the centre of most, if not all, activities. If an innovation challenges this posture, its situation is quite precarious. For the innovation to succeed, its worth must become so clear that the teacher is willing to change some aspects of teaching. Mooij and Smeets (2001:23) further argue that teachers claiming to follow more innovative educational practices (use of inquiry, project-oriented work, hands-on activities) are more likely to use new technologies than those who stick to the more traditional instructional approaches. Teachers must believe that using technology will not cause disturbances to their higher-level goals that they value as more important than the one being maintained ("disturbance").

Bliss (1986:56) states that change in the teacher's role occasioned by computers was unfavourable and they perceived their traditional role as being threatened. Kinkoph et al., (1994:112) further state that the advocate of computers, through over ambitions claims and an underestimating of practical constrains, seed failure. Computers challenged teacher's fundamental values and practices. According to Molenda and Russel (1996:507), not all teachers are resisting change from traditional methods of teaching to technological ones, but the overall picture that emerges is that the usage of computers in teaching and learning is generally low. Where used, these computers tend to be used as additional aids, not as part of broader classroom activities.

According to Ely (1998:25), major elements identified as obstacles in the way of introducing computers in schools, namely:

- Insufficient number of computers;
- Teachers' lack of knowledge skills; and
- Difficulty in integrating an instruction.

Mooij and Smeets (2001:78) state that if teachers are not confident in their ability or competence to handle computers, this may hamper their willingness to introduce technology in the classroom. Mooij & Smeets (2001:67) further say that the important reason teachers mention for not using computers and other technology is that they are not familiar with computers or they feel unsure about it. Teacher's attitude to adopt computers mode of use is supported by the situational character of knowledge and expertise. Oslon (1995:14) raised the problem that teachers are not provided with enough time to reflect on practice and change. He believes teachers appear to be expected to take substantial risk in accommodating technology in their teaching that threatens their classroom ethos. He further noted that the value of computers is that they may help teachers to confront their experience. Change is not just adoption and integration of the technology but involves personal reflection and adaptation as well.

As Papert (1993:31) puts it, computers can greatly assist teachers in delivering knowledge to students; unfortunately, many teachers are computer illiterate and grow frustrated when it comes to using computers in classrooms. Although most teachers understand that computers are necessary in schools to help students develop skills on which they can build upon later, they are unwilling to use computers within the classroom, as Papert (1993:31) states that:

- The majority do not feel confident with the use of digital equipment, as they perceived themselves to be technically incompetent. Adopting the technology in the classroom is a rather daunting undertaking for the most teachers;
- When the teachers could not grasp all the facts of the software, they are unwilling to use it in their courses;
- When teachers realise that computers cannot swiftly and easily achieve all that they would like in their curriculum, they lose enthusiasm to use them; and
- Teachers are discouraged by the quality and quantity of the hardware and software available.

Servio (1994:56) further points that the teacher's problem is how to convey to learner's certain ideas, basic knowledge in the shortest time possible.
It appears, then, that teachers are facing a challenge of not keeping pace with educational and technological reform themselves but also of helping both future and present practitioners to increase their comfort level to accept and use computers.

Ralph and Young (1993:303) say that most novice teachers, even those who have taken a media course, are uncomfortable with the technologies in teaching. Plateeuw (1997:60) goes on to say that most pre-and in-service educational media programmes have limited results in producing permanent change in teachers' subsequent instruction.

Similarly Servio (1994:74) argues that many young teachers simply lack adequate preparation for, confidence in, and the positive towards using advanced technologies in their teaching. Supporting the above-mentioned reasons for reluctance to use computers, Zembylas & Reese (1999:37) list some of the causes leading to the reluctance of using technologies as:

- The inability of many institutions to purchase and install technology;
- The need to be better inform many educational professionals about proper, full use of technology as a learning tool; and
- The confusing mismatches of networks, databases, and other technology applications that proliferate across countries.

Ncongwane (1993:42) highlights some of the problems that contribute to reluctance in computer usage. Some of the reasons fall within the following categories:

- Poor quality, inaccessibility and/or unavailability of software;
- Indifference towards technology on the part of the teachers due, in part, to inadequate teacher- training;
- Lack of information on retrieval system, or ignorance of media source books; and
- Insufficient time to select and integrate computers into curriculum.

Betram et al., (2001:214) point that substance of opposition to use computers relates to issues of access and equality. They go further to say that teachers are saying there are more urgent things to address in schools than getting computers. "How can we think about computers in our schools when we do not have running water, toilets textbooks or chalks?" (Betram et al., 2001:214). Implications of computer-based technology related changes in society are complex.

According to Haggis (1995:99), teachers are the pivots of any curriculum implementation, and to enhance the learning environment it becomes more germane to motivate the teachers and improve the condition of services and environment of their work. Teachers are expected to take a leadership role in the community but they are relegated to the background.

2.8. The Elimination of Reluctance

Computers will more ever before continue to have an impact on education. Until there is some stability in the technology for the computer-based learning systems, the resistance attitude to the infusion of computers in teaching will be a recurring headache for teachers worldwide. Therefore, it is necessary to eliminate this reluctance.

According to Chaptal (1997:128), the following are the possible solutions to elimination of resistance:

- Curricular should be made more flexible enough for teachers to integrate technology;
- Purchasing media is not sufficient to guarantee its usage and effectiveness. To be successful, computer integration should involve the provision of mediation or support services to help teachers make use of these computers; and
- Technology alone cannot improve teaching and learning. Technology use should be grounded firmly in curricular goals, incorporated in sound instructional processes, and deeply integrated with sound learning content. Absence of this grounding, which often is neglected in rush to glittery applications, means that changes in leaner performance are unlikely.

Zembylas and Reese (1999:137) put it this way: “for teachers that want to integrate computers in their classroom, the support provided to them is minimal and there is no official plan for providing continuous support and opportunities for development for professional development for in service teachers. This can be provided in part through the development of online communities with the help of private and public higher education institutions, within the framework of a technology strategy”.

Zembylas and Reese (1997:137) further say a central idea behind online communities is that learning is a social process an, as such, being a part of a community involves building connections among what is being learned and what is important to the participants with similar goals.

Claeys et al., (1997:148) state the following points to eliminate reluctance:

- Teachers need to be reassured that they will not disappear regarding education because they have function that goes beyond transferring knowledge;
- Schools need support staff on issues other than technical problems and experts in devices other than the traditional ones;
- Teachers need technical support. This can be realized by creating a special division within the school recruiting own staff. Alternatively, schools may rely on external contracts with specialized firms to provide technical support; and
- Successful use not only requires constructive learners guided by devoted an well trained teachers but also high quality, well designed educational software that caters for the needs of the intended pedagogic reform.

Teachers are faced with the challenge of keeping pace with educational and technological reforms and to increase comfort level to accept and use computer-based technology. It is necessary that teachers' training should be combined with actions that advance school epistemology towards a multiple context learning perspective (Ralph & Young, 1993:111). Such an action might be the establishment of extended learning communities that would help to bring together out-of-school learning and school learning activities for possible solutions to some of the problem areas in computer usage. As technology changes almost daily, we need to constantly evaluate the results of those changes in the teaching and learning process.

2.9. Policy and Schooling Context

Technology today appears to hold a major symbolic function in society, as it is associated with imagery of the new, positive change and renewal, and of economic revival. Education has been drawn into the confused notions of a techno-centric society.

As Plateeuw (1997:23) states, “there are a wide range of policy documents that urge educators to grapple with the implications of an explosion in knowledge, coupled with powerful new communication and information processing technologies and therefore promote the widespread of educational computing typically predict that these technologies will: facilitate teaching process, and promote significant positive gains, both in academic and vocational student’s.

According to Salomon (1998:45), policies are drawn or created; nevertheless, implementing policy is a slower and difficult process. We can expert public access to computers to increase, but inequalities in access are likely to persist for the foreseeable future. Policy development is of little practical value unless it is put into practice, that is, its contents are seen to demonstrate improvements in the quality of education provided and the educational standards achieved. In turn, to be sustainable, these improvements are themselves iterative.

School policy development for computer technologies must not be limited by resource implications or by trying to replicate good practice from other institution. Instead it must take the existing systems, reflect on their current efficiency, and reengineer them to become more efficient (Zanker.2005: 52). According to Salomon (1992:78), many policies that were produced, form part of over-arching policies and aim to articulate the efforts of different groupings towards development.

The ICT policy has to be integrated with other governmental and sectoral policies. This requires not only articulation with other policies, but also a shared vision. Such coordination requires the direct involvement of government and high-level endorsement by government leaders. Salomon (1998:19) points out that the developing world, as evidenced by practices in South Africa, are basing their ICT policies and strategies upon the experiences of developed countries and the newly industrial nations.

Their thinking is informed not only by ICT successes and failures though, but also by their own experience of development. Many developing countries aim to include the following features in transformative policies, making them:

- Articulate across sectors;
- Feasible and enabling;

- Take account of real conditions that they seek to change;
- Inclusive in addressing the needs of all citizens; and
- Gender sensitive and aware of not reproducing historic divides or introducing new ones (UNESCO/UNICEF, 2000:54).

In South Africa, the challenge of relating policy to planning, of developing policies that are not just a wish-list but which address problems and pose real solutions, is being addressed. To help developing countries that do not yet have ICT policies in place, Manell and Wehn (1998:266-270), in UNCSTD Working Group Report, have listed the following areas of concern:

- Producing and using ICTs to social and economic advantage.

Policy is required to reduce the potential of ICTs to widen existing social divisions or introduce new ones and to create economic benefits for all.

- Developing human resources for effective use of ICTs.

People are the primary resource in the information age. Policy must ensure that people have the skills to work effectively with the new technologies and that these skills can be updated in accordance with changes in the technology

- Accessing networks.

To avoid exclusion of any players, policies around national information infrastructure must also be for growth and upgrading, as well as integration with the global information infrastructure.

- Promoting and financing investment in ICTs.

Governments must have policies that enable them to actively pursue successful ways of securing ongoing investment in the ICT.

- Creating and accessing scientific and technical knowledge.

Policies that promote the production of scientific knowledge and bring countries into the global society must be advanced.

- Monitoring and influencing the rules of the game.

Governments must ensure that they participate in creating “rules of the game” such as setting standards and policies around intellectual property rights, regulation and trade.

Policies in South Africa have moved a long way towards promoting and understanding the role of ICTs in society in general and in education in particular. There is a rich and productive discourse about the ICTs that provides a useful starting point for promoting ICTs in education.

The real challenge, however, lies in the ability of the policy framework to enable schools to overcome the inequalities of the past and provide quality education for all learners. There are many policy texts dealing with ICTs. The most comprehensive and thought provoking is the Technology Enhanced Learning Initiative (TELI), commissioned by the Department of Education in 1995. The report has many productive suggestions for promoting technology-enhanced learning in schools. TELI investigation emphasies that technology is a means for improving education and an end in itself. In other words, technology is a tool for learning if carefully deployed and is also an aid to improving teaching.

Bertram et al., (2001:14) state that implementing a policy is a slow process-"we can expect public access to computers to increase, but in equalities in access are unlikely to persist for the foreseeable future. Kibby (1997:127) further states that according to policy makers, all children should be aware and be unafraid of how computers work, because computers are pervading industrial societies and are likely to be important in all countries. Since schools prepare children for life, they should prepare them to deal with computers, which ought to be demystified. The South African National Policy about the use of Information Communication Technology has focussed on three issues, namely:

- A conscious attempt to improve the coverage and delivery of the necessary infrastructure for the ICTs(White and Green Paper);
- The policy has focussed on establishing the regulatory and mechanism for the spread of ICTs in South Africa by establishing the South African Telecommunications Regulatory Authority (SATRA); and
- There is growing emphasis on the need for mathematics, science and technology as the key to growth and economic productivity in South Africa (Science and Technology White Paper).

As it is the South African government's goal to ensure that every learner is able to use ICTs confidentially and creatively to help develop the skills and knowledge they need as lifelong learners by 2013, the White Paper on e-Education signed on 27 August 2003 and approved by the cabinet should be implemented by the provinces so that schools can draft their policies. When policies are in place that will help the government to ensure that every school has access and high quality communications services.

Chapter 3

Data Analysis, Interpretation and Presentation

3.1. Introduction

This chapter presents the analysis of data and the findings. The aim is to get the extent to which teachers use computers to facilitate their teaching. The outcomes thereof will be used to recommend what can be done towards encouraging teachers to integrate computers in their teaching so as to help prepare learners in the global village. The central question to the research is: What improvements can teachers/learners experience when using computer-based technology in the learning process.

A questionnaire was designed as a means of collecting data. The questionnaire was based on the gaps found in the literature review. The researcher administrated questionnaires to ten educators from each of the five primary schools in Mankweng Circuit of the Limpopo Province. A questionnaire consisting of thirty-two questions was designed. It consisted of Sections A, B, C and D. These different sections in the questionnaire consisted of the following:

- Section A covers general biographical information of the respondents;
- Section B is concerned with the availability of teaching technology in the schools;
- Section C concentrates on training received by teachers in computer usage; and
- Section D focuses on attitudes of teachers towards usage of computers.

SECTION A

3.2. General information

3.2.1. Gender

Table 1.

Respondents	Frequency	Percentage
Male	13	28,9
Females	32	71,1
Total	**45**	**100%**

The majority of the respondents (71,1%) are females, whereas 28,9 of the respondents are male. The results show that there is a significant difference between genders. The unequal access in terms of using computers is a reflection that female teachers are aware of the importance of computers.

3.2.2. Age

Table 2

Respondents	Frequency	Percentage
25 - 30	1	2,2
31 - 35	9	20,0
36 - 40	13	28,9
40 - +	22	48,9
Total	**45**	**100%**

Most of the respondents (48,9) indicated that they are above forty years of age, followed by those in the late thirties. There is only 2,2% of the respondents below thirty years. The majority of young teachers with relevant knowledge of teaching using the computers were not in the system due to the moratorium (department) of post establishment. The majority of teachers in the system who have been working for many years and are older than forty years never received training in computer usage for teaching and learning when they train to become teachers. It therefore implies that despite various recommendations about the necessity to computer usage for effective teaching and learning, it is still not applicable to date.

3.2.3. Teacher Qualifications

Table 3

Respondents	Frequency	Percentage
Professional	37	82,2
Academic	8	17,8
Total	**45**	**100%**

Table three indicates that the majority of the respondents (82,2%) had obtained a professional qualification, whereas 17,8% of the respondents' possess academic qualification. This shows that the majority are highly qualified in the level of professionalism. High qualifications in this instance seem to impact on the success of teachers or may rather be a contributory factor towards the use of computers.

3.2.4. Length/Period of teaching

Table 4

Respondents	Frequency	Percentage
0 – 4yrs	10	22,2
5 – 8yrs	7	15,6
9 – 10yrs	4	8,9
11 + yrs	24	53,3
Total	**45**	**100%**

The majority of the respondents (53,3%) had more than eleven years of teaching experience, whereas 22,2% of the respondents reported between zero and four years teaching experience. Teachers with more years in teaching seem to be interacting more with the computers, as they know the importance of using computers outside the school campus.

Section B

3.3. Availability of Technology

3.3.1. Respondents view on factors that make teaching effective

Table 5

Respondents	**Frequency**	**Percentage**
Teaching Method Only		
Computer-based Technology	3	6,7
Combination of the above	42	93,3
Total	**45**	**100%**

Most of the respondents (93,3%) have indicated that the combination of teaching method and computer-based technology makes teaching effective, whereas only 6,7% of the respondents thinks that computer-based technology makes teaching effective. The above table indicates that there is a good interaction of the two methods to make teaching effective. If one method is used in teaching, it may not always result with better performance from the learners. While this may not serve as the only indicator for making teaching effective, interaction presupposes better results.

3.3.2. Method playing a central part in teaching

Table 6

Respondents	**Frequency**	**Percentage**
Questioning		
Info discovery	20	44,4
Variety of media	12	26,7
You as facilitator	13	38,9
Total	**45**	**100%**

The highest percentage of the respondents (44,4%) indicated that information discovery plays a central part in teaching whereas 26,7% thinks that a variety of technologies plays a central part, and 38,9% still think the teacher is important than the media.

It is encouraging to realise that the majority of the respondents are implementing the OBE principles, which, according to Van der Horst and McDonald (1997), encourage the OBE learner not to be passive recipient of knowledge, but an active participant in the learning process. Garceau and Bloom (1994) further support the statement by saying that computers have transformed the teacher into the role of "guide or supervisor", leading learners to discover information from the teacher.

3.3.3. Usage of computer-based technology in school

Table 7

Respondents	**Frequency**	**Percentage**
Yes	9	20
No	36	80
Total	**45**	**100%**

The majority of the respondents (80,0%) indicated that they do not use computer-based technology at school due to lack of skill to effectively teach using computers. Only 20,0% of the respondents has indicated that computer-based lessons are used at school. The need for the learners to be able to cope with daily problems in a dynamic world has led many educators to conclude that computer technology integration in education will enrich the learning environment. Unfortunately, many teachers have not yet realised that as they consider themselves as the only medium of providing lessons to learners. Ralph and Young (1993) say that most novice teachers, even those who have taken media course, are uncomfortable with the technologies in teaching.

3.3.4. Media frequently used

Table 8

Respondents	Frequency	Percentage
Television	3	6,7
Computer	3	6,7
Radio	2	4,4
Overhead Projector		
None of the above	37	82,2
Total	**45**	**100%**

The majority of the respondents (82,2%) indicated that none of the above mentioned media is used at their school. This is interesting as proponents of using computers indicated that computers can support and enhance problem-solving environment and can decrease the amount of time required to master skills, allowing more time to be spent on developing conceptual understanding. Only 6,7% of the respondents indicated that it uses television and computers. As Male (1997) puts it, the growth of computer usage in education is a global phenomenon. Countries in both developing and developed worlds have expressed visions of participating in, and shaping the global information society. Invariably, these visions emphasise education as a primary way for computers to produce competent learners, suitably qualified and skilled to contribute to the economic growth.

3.3.5. Replacement of teachers by computer-based technology

Table 9

Respondents	Frequency	Percentage
Yes	32	71,1
No	13	28,9
Total	**45**	**100%**

Most of the respondents (71,1%) indicated that they fear computers will replace them in future, whereas 28,9% of the respondents indicated that they are not intimidated by the use of computers. This implies that some teachers are reluctant to use computers in the teaching and learning situation.

As Bertram et al., (2001) say, many people have argued that computers will replace teachers in the classrooms because they can provide access to so much more information than any ordinary teacher can ever know. Claeys et al., (1997) negate this statement when they say that teachers need to be reassured that they will not disappear from matters regarding education because they have functions that go beyond just transferring knowledge.

Section C

3.4. Training received by teachers

3.4.1. Having computers at school

Table 10

Respondents	Frequency	Percentage
Yes	45	100
No		0,0
Total	**45**	**100%**

All the respondents (100,0%) indicated that they have computers at schools. However this is not an indication that the computers are used for teaching. This implies that teachers realise that the future may become ambiguous without computers for today's children in this rapidly changing world. As Rotem (1998:25) puts it, the need for students to cope with daily problems has led many educators to conclude that technology in education will enrich learning environment in schools.

3.4.2. Computer skills

Table 11

Respondents	Frequency	Percentage
Yes	12	26,7
No	33	73,3
Total	**45**	**100%**

The majority of the respondents (73,3%) did indicate that they lack adequate computer skills hence they do not use computer-based technology. 26,7% of the respondents indicated that it has computer skills and are able to use computers, although these are never enough for everybody in schools. Papert (1993), in his study of student performance and teacher behaviour, concluded that success, usefulness and effectiveness of technology would depend upon an instructor's skill in choosing the appropriate hardware and software. This shows that most of the teachers do not know how to operate computers and they lack the skills to teach using them.

3.4.3. Adequate training of respondents

Table 12

Respondents	Frequency	Percentage
Yes	10	22,2
No	35	77,8
Total	**45**	**100%**

Most of the respondents (77,8%) indicated that they did not receive adequate training in computer usage. 22,2% did indicate that they receive continuous training in computer usage. Lack of training in the use of computers does presuppose the non-usage of them by teachers. It can only be hoped that continuous teacher training can serve as a potential condition for computer usage because computer techniques and skills change hence they require teachers to upgrade their skills as the technology world changes too.

3.4.4. Teaching using computers

Table 13

Respondents	Frequency	Percentage
Yes	10	22,2
No	35	77,8
Total	**45**	**100%**

The majority of the respondents (77,8%) do not have knowledge of teaching using a computer whereas 22,2% possesses the knowledge of teaching using computers. Although teachers acknowledge the significance of using computers many still lack the necessary skills to do that. Geisert (1990) states that teachers in general teach the way they were taught, and the typical classroom is organised around the concept of one teacher and a group of students, with the teacher at the centre of most, if not all, activities. If an innovation challenges this posture, its situation is quite precarious.

3.4.5 Collaboration with other schools

Table 14

Respondents	Frequency	Percentage
Yes	5	11,1
No	40	88,9
Total	**45**	**100%**

Most of the respondents (88,9%) indicated that there is no collaboration with other schools, as many do not use computers, whereas 11,1% of the respondents indicates that they collaborate with other schools that use computers to improve their knowledge base. Steen (1997) says that by collaborating with others, teachers will have the opportunity to review their own technological knowledge and understanding against that of others, and to refine and reflect on their growing ideas about the way the world works. Schrum and Berenfeld (1997) further say that, by connecting our classroom, we can make the educational process available to everyone, regardless of geographical or social-economic circumstances.

3.4.6. Achieving the desired goals

Table 15

Respondents	Frequency	Percentage
Yes	13	28,9
No	32	71,1
Total	**45**	**100%**

Most of the respondents (71,1%) indicated that they do not know how far they can go and achieve, as they do not use the computers due to lack of knowledge and training. Only 28,9% of the respondents indicates that they will achieve the desired goals by using computers. This point out that support services is needed to monitor and evaluate the work done by 71,1% of the respondents to help them to improve the technical know how and effectively use computers in teaching. Chaptal (1997) further adds that purchasing the computers is not sufficient to guarantee its usage and effectiveness.

To be successful, computer integration should be grounded firmly in curricular goals, incorporated in sound instructional process, and deeply integrated with sound learning content. The absence of this grounding, which too often is neglected in the rush to glittery applications, means that changes in learner performance are unlikely.

3.4.7. Awareness of computer-based technology opportunities

Table 16

Respondents	Frequency	Percentage
Yes	14	31,1
No	31	68,9
Total	**45**	**100%**

The majority of the respondents (68,9%) indicated that they are not aware of the computer-based technology opportunities, and yet these opportunities are essential to prepare learners for the economic and social realities of today and what they will face in years to come. The 31,1% of the respondents indicates that it has knowledge on computer-based technology opportunities outside the school. This means that many teachers are not aware that their work will result in higher performances as measured by increasingly demanding global challenges.

3.4.8. Skills to be achieved

Table 17

Respondents	Frequency	Percentage
Communication	5	11,1
Listening	2	4,4
Questioning	1	2,2,
Thinking	3	6,7
Don’t know	34	75,6
Total	**45**	**100%**

Computer-based technologies help to promote the independent learning skills that contribute to lifelong learning. Although there are a number of skills that computers can develop, the majority of the respondents (75,6%) do not know which skills can be achieved as they do not use computers, whereas 11,1% of the respondents develop communication skill and 6,7% of the respondents want to achieve thinking skill.

This implies that those who use computers are inadequately using them for making teaching effective, as other skills are least developed. Schrum and Berenfeld (1997) say that computers should help students to enhance their communication, social and collaborative skills as they interact and learn with their peers and online mentors. They also develop critical thinking skills when collaboratively analysing and solving problems.

3.4.9. Computers imparting a specific knowledge

Table 18

Respondents	**Frequency**	**Percentage**
Yes	41	91,1
No	4	8,9
Total	**45**	**100%**

The majority of the respondents (91,1%) indicated that computers impart specific knowledge to learners even if they lack the knowledge on how to use them. Teachers who do not think computers impart a specific knowledge constitute only 8,9%. This implies that teachers do not know that computers have the potential to meet the needs of an individual learner.

Section D

3.5. Teachers attitude towards computer usage

3.5.1. Achievement of better results without the use of computers

Table 19

Respondents	Frequency	Percentage
Yes	38	84,4
No	7	15,6
Total	**45**	**100%**

Most of the respondents (84,4%) indicated that better results could be achieved without the use of computer-based technology. Only 15,6% of the respondents says that they achieve better results when they use computers. This implies that computers are used as additional aids, not as part of broader classroom activities. Ely (1998) identified elements such as lack of knowledge and difficulty in integrating an instruction, as obstacles in using computers. This might be the reason why many teachers are uncommitted to the use of computers and think they achieve better results without them.

3.5.2. Finding it interesting to teach using computers

Table 20

Respondents	Frequency	Percentage
Yes	13	28,9
No	32	71,1
Total	**45**	**100%**

The majority of the respondents (71,1%) indicated that they do not think or believe it is interesting to teach with computers as they teach without the aid of computers and still find better results. 28,9% of the respondents believe it is interesting to teach using computers as it opens up the learners world of knowledge. This implies that some teachers do not realise that the use of computers leads to more positive results because course content, quality of instruction, and school performance in general improves more than with the use of traditional instruction alone. Katz (2000) says the success of the implementation of advanced and sophisticated computer approaches in the teaching and an instructional process depends mainly on a teacher's computer competence.

3.5.3. Getting irritated when using computers?

Table 21

Respondents	Frequency	Percentage
Yes	34	75,6
No	11	24,4
Total	**45**	**100%**

Most of the respondents (75,6%) have indicated that they do not feel comfortable when using computers. This could be attributed to the general lack of knowledge and skills of using computers for teaching Only 24,4% of the respondents perceives themselves as technologically competent as they do not get irritated when using computers. Although most teachers understand that computers are necessary in schools to help learners to develop skills on which they can build upon later, they get irritated and are unwilling to use them within the classroom because they somewhat feel under prepared for lessons at the time due to lack of skills. Papert (1993) says that when teachers realise that computers cannot swiftly and easily achieve all that they would like in their curriculum, they lose enthusiasm to use them.

3.5.4. Computers as entertainment

Table 22

Respondents	Frequency	Percentage
Yes	32	71,1
No	13	28,9
Total	**45**	**100%**

The majority of the respondents (71,1%) have not yet accepted the integration of computers in teaching as they still think that computers can be confused with entertainment. The few respondents (28,9%) indicated that computers are tools that can be used to teach effectively and not for entertainment. This does not give a positive image about our education when teachers do not regard computers as part of the lesson but as something that can afford entertainment during lesson presentation.

This also reflects why so many of them do not seriously consider acquiring technological skills to use for teaching. Azarmsa (1998) says computers do not possess any disadvantages; it is only wrong perceptions that may lead to their ineffectiveness.

3.5.5. Computers undermining personal contact

Table 23

Respondents	**Frequency**	**Percentage**
Yes	32	71,1
No	13	28,9
Total	**45**	**100%**

Most of the respondents (71,1%) do agree that computers can shift space for personal contact with the learners. Only 28,9% of the respondents do not agree with the statement. There will still be personal contact during teaching when using a computer only when the teacher is able to guide the class to pay attention to verbal instruction in computer lessons. This implies that teachers have not yet understood that in self-learning situations, the role of teachers must change and computers do not undermine their personal contact.71, 1% of the respondents indicate that computers do not encourage personal contact with learners perhaps because they have not been in a situation of teaching with computers to see how that can be resolved. This is an assumption and it should be seen in a serious light and not acknowledged at all as it may not encourage the use of computers in schools, which would limit the learning of our learners.

3.5.6. Losing authority when using computers

Table 24

Respondents	Frequency	Percentage
Yes	33	73,3
No	12	26,7
Total	**45**	**100%**

The majority of the respondents (73,3%) have indicated that they believe that they may loose authority in class when computers are used, whereas 26,7% of the respondents feels that learners are attentive when computers are used and they does not lose authority. This indicates that most teachers are not aware of the efficient methods of integrating teacher's objectives, learning outcomes, and the computers into a total learning environment. This is something that can be addressed by continuous teacher skills training.

3.5.7. Access to computers restricted

Table 25

Respondents	Frequency	Percentage
Yes	8	17,8
No	37	82,2
Total	**45**	**100%**

Most of the respondents (82,2%) have indicated that they do not have access to computers usage as it is restricted at their schools. 17,8% of the respondents have indicated that they have access to the use of the computers. This implies that most teachers are not familiar with the advanced hardware and software packages because apart from not having access to computers they also do not have the opportunity to learn and practice the skills they would use for teaching with computers.

3.5.8. Support from the government

Table 26

Respondents	Frequency	Percentage
Yes	4	8,9
No	41	91,1
Total	**45**	**100%**

The majority of the respondents (91,1%) indicated that the government does not always give any support to schools for integrating computers in their teaching. Only 8,9% of the respondents indicated that they get support from the government. This implies that the integration of computers in teaching will not succeed accordingly if there is no provision for ongoing support services. Support is more important together with training for positive learner outcome. Claeys et al., (1997) state that schools need support staff on issues other than technical problems and experts in devices, other than the traditional ones.

3.5.9. Ability to maintain computers

Table 27

Respondents	Frequency	Percentage
Yes	39	86,7
No	6	13,3
Total	**45**	**100%**

The majority of the respondents (86,7%) indicated that they find it difficult to maintain computers. Only 13,3% of the respondents indicated that their schools are able to funding maintain computers. Schools lack funds to maintain computers because mostly goes to buying books and is always limited. The statement is supported by Azarmsa (1998) when he says that the reasons for implementing computer-network are sometimes overwhelmed by the cost and problems associated with its maintenance and use. These are some of the problems faced by the Department of Education.

3.5.10. Policy in computer-based technology

Table 28

Respondents	Frequency	Percentage
Yes	8	17,8
No	37	82,2
Total	**45**	**100%**

The majority of the respondents (82,2%) indicated that they do not have any policy dealing with computer-based technology. 17,8% of the respondents indicated that they have a policy at schools on when and how to operate computers. Salomon (1998) puts it, perhaps policies are drawn or created, however, implementing policy is a slower and difficult process. Policy development is of little value unless it is put into practice.

Chapter 4

Summary of the findings, conclusion and recommendations

4.1.Introduction

In this chapter, results from the five schools in the Mankweng Circuit on the effective use of computer-based technology in teaching were analysed. The analysis was based on the availability of computers, training received by teachers, and attitudes of teachers for the purpose of making teaching more effective using computers.

The analysis reveals that more teachers are not positive about the use of computer-based technology, which suggests that the availability of computers in schools is not always a way means that teaching can be effective. It has further been discovered that collaboration between schools is undermined, as most teachers do not use computers in schools because the teachers also do not use them. This chapter, therefore, presents a summary of findings, conclusion and recommendations of the study on the effective usage of computer- based technology in teaching.

4.2. Summary of the findings

An analysis of the results reveals that most teachers did not receive any training in the use of computer-based technology; therefore they are reluctant to integrate computers in their teaching as this makes them appear as under prepared. Some teachers believe that better results can still be achieved without the use of computers. Even teachers from schools that are known to be using computers intensively are still not using computers as an integrated part of everyday schoolwork because they lack the skill of integrating what they teach with technology.

It was further found that many teachers do not express any considerable interest in learning how to use computers, as there is no consistent support and regular extensive training in order to assist to integrate the computers into their teaching practices.

Hence teachers end up thinking that computers take away their major responsibility of teaching and getting to know the learners as they lack contact, and thus fear the loss of authority in the classroom if they change their roles and share teaching with computers than with learners.

Most schools do have computers but neither have capacitated and trained computer teachers at school nor teachers with the ability to integrate computers effectively into the normal schooling routine. This is a huge challenge that the government of South Africa has to face if it wishes to bring its learners aboard the information age. The government needs to support schools that use computers in their teaching. The reasons for implementing computer-based education are sometimes overwhelmed by other social problems faced by many schools. In many schools, computers lie unused because teachers are unable to use them. Access to computers is also restricted to few teachers in other schools and this creates a negative attitude towards computers in other teachers. Both in-service and pre-service teacher training should be addressed in order to have good technology innovations.

The other finding was that there is lack of collaboration between schools, so learners are unable to share resources as most teachers lack knowledge of the importance of computer-based technology outside the classroom. Therefore, teachers are denying learners the chance of sharing their experiences with learners from other geographical areas and becoming more efficient at a variety of settings. The ability to communicate rapidly and more efficiently gives rise to a ‘virtual community’. There is also a need for schools to consider how well provincial computer-based technology policy in education articulates with the national policy so that they can make their policies, as it was found that there are no policies in most schools.

4.3.Conclusion

Computers have revolutionized the educational process by providing quicker learning, better comprehension, and increased recall in selected studies. Most schools have done little to have computers at the core of their programmes. Even today, a widespread application of computer technology in education has not occurred because of the failure to adapt to the technology. For true success, computer aided education must do more than textbooks. It must provide an immense environment for multidimensional learning that is uniquely enjoyable and stimulating. While both traditional and computer-based delivery systems have important roles in supporting instruction, they are of greatest value when complementing one another.

Although there are plans to expand the use of educational technology in schools, very little is discussed about the need to reform teacher training and teacher preparation programmes. Both in-service and pre-service training should be addressed in order for technological innovations to succeed. For teachers that want to integrate computers in their classroom, the support provided to them is minimal. There is no official plan for providing continuous support and opportunities for professional development of teachers. From a policy perspective, there is a need to consider how provincial computer-based technology policy in education articulates well with the national policy.

Computer-based learning systems are expensive to develop; thus imposing problems of uniformity, and associated difficulties in adapting learning programmes to local conditions and differences between learners. The examples used by standard programs may not be appropriate to the prior experience of learners or local conditions and contexts. The number of computers at a school also does not determine the effectiveness of computer usage. Effectiveness will be measured in terms of skills that are increasingly important in today’s society when learners enhance their communicative, social and collaborative skills as they interact and learn with their peers and online mentors.

4.4. Recommendations

On the basis of the findings discussed, the study recommends the following:

- There should be an ongoing support and resource base to guide teachers as the current pace of change causes great pressure on teachers, and teachers may subsequently shy away from the use of new technology. If computers are to become part of the school curriculum, it is necessary for teachers to be trained first as most teachers do not like to be surprised. It is important for teachers to be told about the changes so that they will not lose interest and be reluctant to use computers;
- The use of computers for skills development should be promoted through upgrading programmes for those teachers who have the technical know how to operate a computer but do not know how to teach with the aid of a computer. This implementation process must be closely assessed in order to prevent unwanted educational mistakes that can easily accompany the assimilation process and affect learners negatively. Such an action should be further promoted by the establishment of extended learning communities that would bring together out-school learning context and school -learning activities and also encourage and promote the development of computer capabilities in less well-resourced schools;
- Teacher training institutions should include in their curriculum a course in continuous computer literacy, to provide preservice to teachers with the necessary skills to apply computer-assisted instruction as a complementary method to the traditional teaching methods;
- Computers should not only be used for computer-based instruction, but should be used to assist the improvement of learning as they add another dimension to a teacher's repertoire of strategies, which can improve learning.
- The government should introduce a human resource capacity structure; develop the national guidelines and criteria for the training of teachers in computer usage; and also be able to organise workshops and seminars on production and utilization of computers for teachers. These will give teachers who lack previous exposure to computers an opportunity to use computers in the teaching-learning situation. For those who have some experience, such seminars would help to update their knowledge and sharpen their skills; and

- It is lastly recommended that a study should be made of the possible elimination of reluctance to use of the computer-based technology.

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Questionnaire Schedule

Please complete the questionnaire as accurately and quickly as you can. It is not a test and there is no right or wrong answer.

Your answer will be treated as confidential and will not be used to identify you, as an individual, to anyone else.

A. General Information

(Please tick in the appropriate box the correct number or letter for each question)

1. Gender

Male	1
Female	2

2. Age

25 – 30	1
31 – 35	2
36 – 40	3
41 - +	4

3. Highest teacher's qualification

Professional qualification	1
Academic qualification	2

4. For how long have you been teaching?

0 - 4 years	1
5 - 8 years	2
9 - 10 years	3
11 + years	4

B. Availability of technology

5. Which of the following do you think make/s teaching more effective?

Teaching only	1
Instructional technology only	2
Combination of the above	3

6. Which of the following play/s a central part in your teaching?

Questioning	1
Information discovery	2
Variety of media	3
You as facilitator	4

7. Do you use any technology – based media in your school?

Yes	1
No	2

8. If yes, which of the following do you use frequently in your teaching-learning situation?

Television	1
Computers	2
Radio	3
Overhead Projector	4
None of the above	5

9. Do you think the technology-based media are going to replace teachers in future?

Yes	1
No	2

C. Training received by teachers

10. Do you have computers at school?

Yes	1
No	2

11. Do you have computer skills?

Yes	1
No	2

12. Has adequate training been given in how to operate the computer?

Yes	1
No	2

13. Do you have knowledge on how to teach using a computer?

Yes	1
No	2

14. Are you collaborating with other schools with regard to computer usage?

Yes	1
No	2

15. Are you achieving the desired goals when using computers in teaching?

Yes	1
No	2

16. Are you aware of the computer-based opportunities outside the school?

Yes	1
No	2

17. Which skills do you like learners to achieve when using computers?

Communication	1
Listening	2
Questioning	3
Thinking	4
Don’t know	5

18. Do you ensure that the computers impart specific knowledge to learners?

Yes	1
No	2

D. Attitude towards computers

19. Do you think learners achieve better when there is no computers?

Yes	1
No	2

20. Do you find it interesting to teach with the help of a computer?

Yes	1
No	2

21. Do you get irritated when using a computer?

Yes	1
No	2

22. Do you think computers can be confused with entertainment?

Yes	1
No	2

23. Do you feel computers undermine personal contact?

Yes	1
No	2

24. Do you lose authority when teaching using a computer?

Yes	1
No	2

25. Is access to computers restricted to a few members of staff?

Yes	1
No	2

26. Do you get any support from the government?

Yes	1
No	2

27. Does your school find it difficult to maintain the computers?

Yes	1
No	2

28. Do you have any computer-based technology policy in place at school?

Yes	1
No	2