



# Investigating Secondary Teachers use of computers in teaching and learning in Nyanza province, Kenya

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## ABSTRACT

Technology especially computer skills plays a key role in promoting the economic development of a country. Many of the productivity gains in the developed world economies over the past decades can, to a great extent be attributed to the impact of technology in particular computer. Most governments appreciate and recognize that technology use and computer literate work force is the foundation on which a nation can acquire the status of a knowledge economy. Advancement in technology has dramatically revolutionized ways in which information is collected, analyzed, transmitted and stored. This has made computer very important equipment in industry, government and private organizations. Educators and curriculum planners have been compelled to go back to the drawing board to re-examine the national goals and objectives of education. Against this background, Kenya decided to make education the natural platform for equipping the nation with computer technology skills in order to create a dynamic and sustainable economic growth. Computer education was introduced in Kenya public secondary schools in 1996 so that learners could be computer literate, to achieve national goals of education and to advance their knowledge as they prepare to venture into various careers in the areas of Information Communication Technology in order to compete for world market jobs. The purpose of this study was to investigate the extent of utilization of computer technology in public secondary schools in Nyanza Province and to state the reasons why teachers use it in teaching and learning. The study used a descriptive survey design, and was conducted in twenty-five secondary schools that had computers at the time of this research. Participants included 25 Principals, 89 heads of departments and 20 classroom teachers. The secondary schools represented rural, urban and suburban areas. Data was collected using questionnaire for principals and heads of departments, while semi-structured interview schedule was used to collect data from classroom teachers. Data analysis involved descriptive statistics that combined qualitative and quantitative methods. The main research findings indicated that teachers used computers to improve students' communication skills, to teach science, mathematics and computer literacy skills. Principals and heads of departments supported and encouraged teachers to use computers to improve performance in academic subjects. The majority of schools did not have enough computers and teachers were not adequately trained in the use of computers.

**Keywords:** *Computers, learning, integration, teachers, subjects, students, secondary school*

## INTRODUCTION

The recent decision by the Kenya government to introduce computer technology in public secondary schools was a bold step in the right direction. The message was well received. Some of the Principals /Headteachers purchased computers and encouraged teachers to use them in teaching and learning. A survey was conducted to provide evidence on the use of computers in public secondary schools and reasons why teachers use them in teaching and learning. Researchers from developed countries have reported the use of computers as a tool in the classroom to teach computer literacy skills; using computer to do complex calculations, data manipulation, word processing and presentation, either within the existing school subjects or in special courses (Azita 1999; Clark 2000; Crook 1994; Heinich, Molenda, Russell and Smaldino 2002; Zhang 2000). The first usage involves direct instruction in school subjects Heinich et al.1996). Heinich et al (1996) defines computer literacy as the ability to understand and use computers. They also explain that computer literacy instruction incorporates three types of objectives such as knowledge, skill and attitude. The knowledge objective includes understanding of the terminology, identifying the components describing computer applications and analyzing

social and ethical issues concerning the use of computers. While the skill objectives include learning keyboarding and the ability of the students to use computers for different applications such as word processing, searching database and retrieving information.

Higdon (1994) noted that the definition of computer literacy depends on the computer literacy course program or focus of the teaching process. She points out that if the focus is science based, then the computer literacy skills become more specialized in nature. But she concurs with other researchers (Heinich et al. 1996, Abas 1995, Karston and Roth 1998) that word processing, spreadsheet, database creation and usage are the basic skills that are necessary for any student to learn in a computer literacy course.

Nicholas 1996; Owston and Wilderman 1997 and Zhang 2000) report the use of computers to learn how to use word processing. A word processing is a writing tool just like a pen or pencil. It is a valuable tool used in all introductory computer literacy courses. A word processor makes changes easy by easing, moving and copying text and all other ordinary typing tasks may be done quickly, neatly and efficiently. In addition, a word processor allows students to easily revise and edit their composition, thereby avoiding too



much recopying of the work. This enables students to demonstrate pride in producing legible, neat and attractive piece of work as they practice word processing skills. Word processing helps to eliminate the physical barriers that students experience as they struggle to make letters. Therefore, Heinich et al (1996:226) stress the need for every student to be familiar with word processing skills because it helps to improve students writing skills, reading and composing stories. Other scholars have also reported the use of computers applications to improve teaching and learning traditional subjects like mathematics, science, language and social studies (Azita, 1999, Hargaren and Kenton 2001).

Alessi and Trollip (1991, Heinich et al 1996, Ken and Anderson 1990) indicate the use of computers to learn spreadsheets. Heinich et al (1996, 2002) describe a spreadsheet as a page of rows and columns that displays word, numeric and formula entries average and manipulate data. They point out that spreadsheet programs are easy to use tools that should be exploited by teachers and students to create graphic from data. Allesi and Trollip (1991) add that spreadsheet can also help teachers to budget and carrying out evaluation of students' examination results. Students may use a spreadsheet to compare the return on funds invested at various rates of interest, and work out income when different taxes are applied to the interest earned. The use of spreadsheet is most applicable in school subjects such as business studies, economics and mathematics. Students can also use spreadsheets in "problem involving time, distance and speed, and relationship between sides, diagonals and angles in two-dimensional shapes" Ken (1990). The use of spreadsheets helps students to plan, predict and to explore given data. Therefore, in order for the students to learn and benefit from the capability of spreadsheet effectively, the teacher needs to play an active role. As the students work with spreadsheet, the teacher should be able to encourage them to explore, challenge their hypotheses and help them to evaluate their prediction.

Alkin (1992) specifically reports that computers have been used in secondary schools in developed countries for the purpose of teaching programming. It is claimed that programming skills will lead to a better or more rapid development of higher cognitive skills or "improve thinking, comprehension of basic concepts, problem-solving abilities, planning abilities and precision of expression and to lead to the discovery of powerful ideas. Moreover, Underwood (1994) adds that logo programming provides an environment for the exploration of mathematical concepts. Secondly, programming skills will be useful in helping students to find employment and to prepare some students to proceed for more advanced college course (Alkin 1992, McCoy (1996, Makau 1999. McCoy (1996) noted the importance of teaching students programming skills and reported that in learning programming, students write their own programmes and create mathematical models then the computer provides immediate feedback to assist them in exploring and refining

their knowledge. Similarly, Makau (1999) noted the value of learning programming skills. Makau (1999) feels that some aspects of programming should be taught in secondary schools in Kenya since programming has grown into a profession just like accountancy, law or medicine.

Further more, researchers have examined user of computer to maintain Database (Heinich et al. 1996, Ken and Anderson 1990). A database is a computer program intended to keep information in an ordered form like a filing system. It is simply a collection of related information organized for quiet access to specific items of information. Heinich et al. (1996:408) feel that students in schools need to learn how to manage information, to retrieve information, to sort out resources, to organize information and to evaluate their findings. They believe that students can create databases for inquiry and research studies and at the same time they can create their own database. Once the students complete constructing databases as part of their learning exercise they are able to engage in higher-level of thinking skills as they analyze and interpret the data with the help of the teacher.

Several studies have recently examined learning mathematics with computers. McCoy (1996:438) reviewed may studies on computer-based mathematics learning and found that computers have been used to teach mathematics in three distinct ways: programming logo; computer Assisted instruction (CIA) and as mathematical education tools. However, a study by Azita (1999:33) to investigate the extent to which computers was being used by middle high school mathematics teachers in America found that mathematics teachers did not use computers for any other purpose apart from drill and practice. He also found that teachers did not have adequate knowledge about when and how computer could be used in teaching and learning mathematics, because they were not effectively trained in the use of computers to teach mathematics. Azita suggested that there is need to encourage teachers to find more time to teach with computers and thereby to interact collectively with students as they learn mathematics. He recommended the integration of computers into mathematics curriculum in order to provide a problem-solving environment for the learners and the teachers.

Previous studies on learning science with computers have indicated the capabilities of computers to improve students' scientific knowledge. Woodrow (1994) noted the value of integrating technology into science teaching and stated that "computer-based technology gives science teachers access to reach variety of textual materials and graphic information. Woodrow (1994) explained that the use of computers provides new instructional strategies that the teacher and students can employ. This includes sophisticated laboratory and simulation tools. Heinich et al (1996, Christman and Budget 1999) support the approach to integrated computer into the school curriculum and hence into teaching science. Computers have also been used successfully in teaching learning social studies. This includes using computer to teach

subjects like economics, geography, history and languages. Some of the early studies found positive gain in secondary students' performance and attitudes towards the subject matter and in using computer for storage and retrieval of information compared with using traditional teaching methods. Computers have been integrated effectively into learning games and stimulations in social studies. Crozler and Caffield (1990:72-77) found that integrating computers into the social studies curriculum aids learners in the development of historical imagination, skills of critical analysis, creativity and understanding of complexity of American history. Addison and Fridman (1997:157-160) also report the positive gains of the research findings on the contribution of computer software in teaching accounting.

There is a good reason to believe that computers can be used to improve and promote the development of students' communication skills, more so in learning foreign languages like English (Crook 1994, Heinich et al 1996, Herman 1995, Hurst 1996). The value of computer is also noted in teaching and learning sentence construction comprehension, composing and in creative writing. Heinich et al (1996:242) recognized the ability of the computer in teaching and learning English language and report that "*spelling and grammar checking are available to students. A thesaurus makes it easier for them to find the right word for a specific situation.*" Carol (1997) felt that integrating computers into teaching English language was an ideal step. She conducted a study in West Midland Schools in England using questionnaire survey to examine the use of computers in modern language teaching. Carol (1997) found that 56% of the respondents used computers to teach languages. She also found that computers were used mostly in revision work, vocabulary and producing text, especially writing letters.

The ability of computers as a tool for teaching and learning graphics have been reported by Crook 1994, San Jose 1995, Alessi and Trollip 1991). There are many ways a teacher can employ graphics in lesson presentation e.g. using graphics as the primary information; using it as analogy; the picture could be the main concept; for focusing attention, on important text information; using computers to extend the learner's experience of drawing, writing, production of geographical shapes, classifying and calculating. San Jose (1995:211) believes that a computer integrated education approach is the best for teaching students graphic skills. He further states that in the field of drawing and design, many professional graphics artists now rely on the power of computers.

The present study investigated and examined the reasons for the use of computers and explored issues of whether computers are employed for similar reasons in Nyanza Province. The following assumptions were tested.

- All schools with computers use them as tools for learning and teaching.
- Computers are effective in teaching students academic subjects and computer literacy skills.

- Teachers and students value computers as tools for teaching and learning.

## METHODOLOGY

### Study Area

The study was conducted in selected public secondary schools in Nyanza Province. It is one of the eight provinces in Kenya and it borders Western Province to the west, Rift Valley to the North, and the republic of Tanzania to the south. Nyanza Province also includes part of Lake Victoria. There are over five hundred secondary schools both public and private.

### Research Design

This study used descriptive survey design that included both qualitative and quantitative methods. Frankel and Wallen (1993) describe descriptive survey research design as a method that involves asking a group of people questions about their perception, attitudes about a phenomena or a particular issue. Kilinger (1994) argues that survey design is suitable because it focuses on people, their attitudes, opinions and behavior. Its advantage is that one can gather a great deal of information in a relatively shorter period of time. Descriptive survey was also adopted for this study because of its appropriateness in seeking to obtain relevant information that describes existing phenomena (Mugenda 1999). Descriptive survey also design also determine a link between the inputs, the process and outcome of a given study (Kerlinger (1999).

### Study Population

The study focused on 20 secondary schools that used computers in teaching and learning at the time of this research. This included 11 boys, 8 girls and 1 mixed secondary schools.

### Sample and Sampling Techniques

Purposive sampling was used to select 20 teachers using computers in teaching and learning. The respondents were male and female drawn from rural, urban and suburban areas.

### Instrument for data collection

The main instruments that were used to collect data were the semi-structured interview. The semi-structured interview was used because it enabled the researcher to use diverse range of techniques to collect data and analyze them both qualitatively and quantitatively. This included the use of probes, tape recording and in-depth interview.

## Data Collection Procedures

The collection of data was carried out in two stages. The first stage concentrated on a selective review of previous relevant literature on the use of computers in teaching and learning. The second phase was concerned with conducting a semi-

structured interview with computer teachers using audio tape recordings.

## Findings

The results of the interviews are shown in the following paragraphs:

**Table 1: Types of secondary schools by location in which interview took place**

School type	Rural Area	Urban Area	Suburban	Total	%
Girls schools	6	1	1	8	40%
Boys schools	7	2	2	11	55%
Mixed schools	1	0	0	1	5%
Total	14	3	3	20	100%

Table 1 indicates that the participants were drawn from girls, boys and mixed secondary schools that used computers at the time of the investigation. 70% of the computer teachers were from rural areas while 15% were from urban and another 15% from suburban.

**Table 2: Age (Years) and gender distribution of the interviewees**

Teachers	Years	Female	Male	Total	%
9	20-30	2	7	9	45%
10	31-40	0	10	10	50%
1	41-50	1	0	1	5%
20	Total	3	17	20	100%

In table 2, the majority of computer teachers (85%) were male while (15%) were female. Most of the interviewees (50%) were between 31 – 40 years; and 20 – 30 were 45% while those of 41 – 50 and above were 5%. The number of years of teaching experience ranged from 1 to 20 years, with an average of 5 years.

### Teachers; Academic qualification and experience with the use of computers

Most of the interviewees 85% had attained university education but 15% had a diploma in education. 55% of them taught mathematics, 25% taught languages and 20% taught social sciences. Computer education was compulsory in 70% of the schools investigated. There was no computer teacher without the knowledge of computer skills, although (45%) of them had a lot of experience with use of computers. 25% of the participants taught computer education in all classes; the other teachers 70% taught computers in form one, two and three, while 5% taught computer education in form

four. Rural teachers 55% were the most experience with the use of computers; 35% had less than one year experience in teaching with computers while 30% had between 2-5 years and 35% had less than ten years experience with the use of computers. Teachers' rating with the use of computers showed that 55% had some experience with the use of computers while 45% had a lot of experience.

### Use of computers application software in teaching and learning

The interviewee reported that they were encouraged to use computers in teaching and learning by the Principals of their schools in order to teach students computer education as in the official computer syllabus. 50% were highly encouraged while 30% were partly encouraged, and 20 % reported not being encouraged to use computers in their schools, but did so on their own initiative since computers were available in their schools. The other findings indicated that all computer teachers



used it to teach computer education, to store data and analyze students' marks. Some of them reported availability of computer software for various subjects that they obtained for integration into subjects like mathematics and sciences. 20% schools used Ms office packages; 20% of them used Lotus 1,2,3; and 20% used Ms Dos, while 15% used Publisher and Accounting 10% and other packages 35%.

### The role of computer in education and development

The interview on the role of computers in the study schools showed that 20% computers played the role of "educating students, teachers and community. 50% reported the role of computer to teaching students computing skills. Other 10% reported using computers to improve teaching of other subjects. And 20% used computers for administrative duties, storing and students' marks.

- Most of the teachers believed that the major role of computers was to teach students computer literacy skills, some of them saw the role of computers as that of creating computer awareness among the school regulation administration and to teach specific subjects in order to help improve the teaching of curriculum subjects by providing reference materials and remedial work.

### Reasons for the use computers in teaching and learning

All the interviewees reported using computers to teach computer literacy skills, word processing, spreadsheet,

database management and programming for the following reasons:

- Preparing learning materials such as teachers' lesson notes, students' handouts and examination materials.
- To improve the quality of teaching and learning by using the materials not easily available to the teachers.
- Learning, especially from the Internet, educational materials on subjects like Biology, Mathematics and History e.t.c.
- To teach students computer science, hardware and software.
- To process students results, e.g. ranking of students, assigning grades, analyzing of performance index for class and overall performance index.

However, the overall findings indicated that all the interviewees 100% used computer to literacy skills, word processing, spreadsheet, database management, graphic and programming. 40% indicated that they used computer to teach traditional subjects like Mathematics, Science, Languages and Technical drawing, but 20% used it to get new ideas for curriculum subjects like statistics, language e.t.c, while 10% reported using computers to motivate students to learn on their own. Similarly, 10% of them used it to keep school record, students examination marks and grade analysis and 20% used it to improve learners' communication skills.

### How teachers use computers

The responses were as shown in table 3

**Table 3: How teachers use computers**

Responses	Participants	%
As a tool/teaching aid	13	65
As a source of information	7	35
Total	20	100

### Teachers' preparation to teach with computers

The findings showed that 80% of them prepared for teaching with computers and 60% had schemes of work while another 60% reported having lesson plan, but 75% did not have lesson plan. Overall, the interviewees noted that the use of computers enabled them to produce neatly written lesson plan.

### Pattern of using computers in teaching and learning

The results indicated that some teachers used computers for drill and practice skills. One of them reported that "Yes I drill my students especially for them to be acquainted with the use keyboard for faster typing of text, and also to know where different keys and groups of keys are". Another one said, "After learning in groups I drill them to compose letters and stories which improves their writing skills". Still another interviewee said "with computers students learn better with drill and practice. They practice on their own after demonstrating to them". A summary of the findings on this question is shown in table 4.

**Table 4: Pattern of using computers in teaching and learning**

Pattern of use	Yes	No	Total
Drill and practice	14	6	20



Enrichment	9	11	20
As a tutor to assist the teacher	7	13	20
For supplementary work	7	13	20
To facilitate learning	4	16	20
For remedial work	4	16	20

Most of the interviewees noted that computer programmes could make the learning process easy for students since they learn by doing as one of them said, *“Once the students have done statistics in mathematics, they come and work on the computer to solve the same problem”*.

### Software used by the students in schools that participated in the investigation

All the interviewees reported that students in their schools used word processor. This is because word processor packages are by far the most common application of

information technology used in schools in developed and developing countries. Word processor is concerned mainly with the manipulation of information both textual and graphics. It allows students to process information and this is an activity that is at the heart of learning. It is also useful for input, editing, correcting work and presenting text of any kind. In addition, 85% of them used spreadsheet citing the importance of spreadsheet as a useful tool for improving mathematical operations and accounting. 70% used Database, and 40% Graphics while programming was used by 30% of the interviewees.

### The response from the participants are summarized in Table 3

Items	Participants	%
Word processing	20	100
Spreadsheet	15	85
Database	14	70
Graphics	8	40
Programming	6	30
Others	7	35

Word processor was used because the packages are by far the most common application of information technology used in schools in developed and developing countries. Spreadsheet was used by 85% citing the importance of spreadsheet as a useful tool for improving mathematical operation and accounting.

### Benefits of using computers in teaching traditional subjects

The responses to this question are shown in table 4

Benefits	Respondents	%
Programs linked with topics taught in class	4	20
Programs well designed and provide new knowledge	6	30
Programs provide more information	5	25
Children enjoy and learn new ideas	2	10
Programs cover topics not available in syllabus	3	15
Motivates students to be creative and learn new skills	3	15

The main benefits of using computers in teaching and learning was that the programs provide students with new knowledge not easily available in the school syllabus.

### Students' knowledge of computer literacy skills

The findings indicated 40% of the teachers reported that their students had basic knowledge of computer literacy skills. They noted that their students were able to operate the machine on their own, use the mouse, keyboard, access files processing their work and print. Another 40% of the teachers reported that their students had average computer skills and were capable of using a word processor to compose stories,

edit the work and retrieve files. While 20% of them had advanced computer literacy skills and were able to use most of the software tools such as word processor, spreadsheet, database and basic programming. However, the current research did not attempt to gather evidence directly from students to verify the teacher's claims about the computer skills of their students. This area will be investigated in another study.

### How students learn with computers

All the teachers interviewed reported that their students learnt with computers in small groups. When asked to give reasons



why the students learn in small groups, one of the participants replied *“learners are action based so they do not enjoy so much theory and while in groups they consult one another”*. But 50% of the interviewee reported that their students learnt with computers individually when they are given assignments, during practice or when doing examination. 75% said that their students learnt with computers as a whole class in addition to individual and group work. One teacher remarked, *“When I am teaching theory, introducing the students to the working of the machine and types of software, I lecture to the whole class”*. Another teacher reported *“Although I allow the students to use computers individually, I must be present to assist them and guard against those who just play cards or smuggle their diskettes with viruses”*. Still another teacher remarked, *“Sometimes I give direction and help learners one by one with using computers to compose stories”*. From these findings, it seems that teachers recognized the need to vary their methods of using computers to meet the needs of the students and demands of what they were teaching. In addition, the majority of the interviewees 70% reported using computers more than four periods per week.

### The impact of computers on students learning

The results indicated that most of the interviewees had not integrated computers into their general teaching and learning processes but one of them responded *“If I am using computer during literacy classes I may make reference to the topic in my subject area then the students look at it in the computer”*. Another teacher reported, *“I use the computer to summarize what I have taught by showing some skills in different subjects e.g. Science, Mathematics and History. However, most of the participants had not been exposed enough to computers to be able to integrate them effectively into teaching and learning.”*

### Value of using computers in teaching and learning

The findings indicates that 65% of the interviewees regarded computers as highly valuable compared to 15% who believed that computers were not valuable and 20% rated it valuable. However, further analysis indicated that 70% rated the use of computers very valuable. One of them commented, *“The use of computers technology, especially in productivity; the way files are kept is exemplary, due to easy access to them, alterations are very easy too”*. Another one said, *“computer makes work easier i.e. much better than a typewriter a calculator”*. Table 6 displays more information

**Table 6: Value of Using Computers**

Rating	Rural	Urban	Sub-urban	Total	%
Highly valuable	12	1	1	14	70
Very valuable	2	0	1	3	15
Valuable	9	1	1	3	15
Not valuable	0	0	0	0	0
<b>Total</b>	<b>14</b>	<b>3</b>	<b>3</b>	<b>20</b>	<b>100</b>

### Attitudes of teachers towards computer education

The findings showed that 60% of the interviewees had a positive attitude while 30% were very positive and only 10% had a negative attitude towards the use of computers. However, it was revealed that teachers generally had a phobia for computers. They fear it so they develop negative attitude about it.

### Views about the use of computers to motivate students

The response showed that the majority 75% believed that computer highly motivate students while 25% rated it motivating as one teacher said, *“the use of computers have really increased the students desire to learn. They are normally very motivated and this enables them to learn even more on the subject area”*. Another teacher said *“in mathematics, there are computer programmes dealing with mathematics that motivates students so any time they are free they ask me to allow them to go to the computer room to learn with computers on their own”*. Still another science teacher said *“students are eager to respond to the computer.*

*It has challenged them to search information from the Internet and they come and ask me what they learnt in science”*. In conclusion, most of the interviewees reported that computer programmes are presented in simple and interesting manner. Some teachers also reported that students are *always “excited and lively”* when it is time for computer lessons.

### Views about computers increasing students' knowledge

All of the participants (20) believed that computers were effective in this respect. They agreed that through the use of computers students have learnt and increased their scientific knowledge. 70% believed that computer increase knowledge/information while 30% said with the use of the Internet, students' access information on different subjects from various libraries or databases. As one male teacher remarked *“Yes it increases knowledge of English subject e.g. when students access the thesaurus it gives them view words and alternative words and phrases so they learn new things”*. This helps to increase their knowledge of other subjects they



learn in class. It also helps to improve their communication skills.

### **Views about the use of computers to widen access to education**

All of the interviewees responded positively and gave various ways in which computer helps to widen learners access to education by: providing various new educational programs and distance learning, through e-mail, Internet and it does not discriminate between learners.

### **Views about computer introducing new ideas**

The findings revealed that 90% of the interviewees believed that computer introduces new ideas to teaching and learning. They indicated that both the teacher and students learn something new from computer programs, as one of them reported *“in computer new ideas come up every time when you access the help facilities.* Another one said *“in mathematics, the computer helps me to teach graphs, square roots, cube roots and means e.t.c.*

### **Teachers' views about computer improving traditional subjects**

95% of the interviewees believed the use of computers helps to improve learning traditional subjects as one of them reported, *“as a result of using computers students managed to pass their examination in mathematics, science, technical subjects and accounting”.* Another teacher said, *“My students improved in Biology after I used computer program because the computer gives vivid information that interprets visual aids.*

### **Teachers' views about computers increasing students attention to learn**

The majority 85% of the interviewees agreed that students are more attentive when they are in the computer room learning with computers compared to when they are in their usual classrooms. In fact, most of them reported fewer discipline problems during computer lessons.

## **CONCLUSION**

Computer education has not been implemented effectively in Nyanza Province of Kenya. This study established that out of more than 500 public secondary schools in Nyanza province, only twenty secondary schools used computer applications in teaching and learning. The introduction and use of computers in schools is essential if the nation is to meet its objectives of producing a population that is equipped with information technology skills to build on the desired goals of industrialization. The study revealed that on average, schools allocated four or five periods per week for computer education classes. However, the majority of the participants

reported using computers adequately in teaching and learning. In so doing, the results revealed that computers were used mainly for the purpose of teaching computer literacy skills. This included learning to use word processing, spreadsheet, database, programming and graphics.

As shown elsewhere in the world, conditions and facilities for the use of computers was inadequate and not suitable for application in teaching and learning. Most teachers were encouraged by their Principals to use computers effectively as a tool for instruction. The teachers in this study reported that computer programmes used by the students to learn computer literacy were those in the syllabus produced at the Kenya Institute of Education (KIE). In addition, computers were used for administrative duties such as keeping students enrollment records, examination results, and for general communication purposes. However, the high profile given to computers in education displayed within the schools I visited, coupled with high level of learners' expectations that the computer technology could play a major role in education, supported the need to integrate computer into teaching and learning various subjects.

Computer education is a new technology to many teachers so it was not valued, although most of them reported that some of the computer software such as spreadsheet linked properly with some topics in mathematics subject, commerce and accounts. Others noted that using a word processor could help students to improve their communication skills. Though many teachers were in their early stages of computer integration, some of them had overcome several major barriers and incorporated computer into traditional subjects

Nevertheless, the overall findings indicated that in most of the schools, students were able to use the word processor to improve English Language and to compose stories. Some of the schools taught students how to use spreadsheet, database and basic programming. Students learnt with computers in a group of four or five, but sometimes they learnt with computer individually. The participants agreed that computer education should be an integral component of teaching and learning. They expressed positive views and opinions about the potential of computers to motivate students to learn and regarded it as a very valuable tool that provide good programs presented in stimulating and interesting manner, helps to introduce new ideas, and improve teaching and learning traditional subjects.

With regards to the impact of computers on students learning, the results showed that students' interest during computer lessons was heightened, and they were lively, keen and eager to learn computer skills. Students recalled what they learnt from the computer programme and were very attentive and concentrated very much on the machine to learn new skills. Teachers reported also that after computer lesson students discussed what they learnt with peers and consulted teachers on various points of the topics they learnt.



Any changes or innovation introduced into a school system needs to be viewed carefully and should be done gradually with the support from teachers and the school management. However, despite the limitations of this study in terms of small number of participants, common themes were evident in the teachers' suggestions for various ways to improve the use of computer in schools. High among their lists of needs included a clear government policy on the provision of computers to schools, teacher training in the use of computer and the knowledge of curriculum issues in relation to computer education. Such suggestions as increased awareness and knowledge of software packages for integration were also cited. From these findings, it would appear that teachers would prefer computer programs with emphasis on subject integration. Therefore, if computers are to be used effectively in schools, the existing teacher training courses need to be built around developing teacher's personal skills in computer utilization.

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