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TEACHERS RELATED FACTORS INFLUENCING THE INTEGRATION OF INFORMATION TECHNOLOGY IN THE TEACHING OF MATHEMATICS IN SECONDARY SCHOOLS IN KENYA

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ABSTRACT

The widespread use of computers in our daily life including education renders preparedness in new technologies necessary. It is therefore critical to understand whether teachers have the necessary skills and attitudes regarding computer integration into their classrooms. The study sets to establish teacher related factors influencing computer integration in mathematics instruction. An exploratory descriptive survey design was used. Mathematics teachers in 25 public secondary schools in the Kakamega South District of Kenya formed the study population. Purposive sampling was used in selecting schools with computers. The sample frame consisted of 147 mathematics teachers stratified into gender. Simple random sampling was then used to pick the required sample in each stratum. Data collection instruments were questionnaires, checklists and interview schedules. Reliability was determined by use of the split half method. Data collected were analyzed using descriptive statistics. The findings indicated that most mathematics teachers have a positive attitude towards computers and are convinced of the positive role that computers can play in the teaching and learning of mathematics. The only aggravating action is the technical know-how and necessary computer skills essential in guiding pedagogical activities towards effective and proper utilization of the computer technologies in the teaching and learning of mathematics.

Keywords: IT Technical Skills, Integration, Teacher Related Factors, Teacher Preparedness

1. INTRODUCTION

Mathematics in Kenya is a core subject and a critical filter for career choices. However, student performance in the Kenya Certificate of Secondary Education examination (K.C.S.E) has been dismal over the years. The analysis of K.C.S.E mathematics examination results for 2002 to 2007 in Table 1, indicate that performance has constantly been below average of 50%. Besides, calculating the mean of means (37.44) clearly indicates that the student performance in each successive year has not improved. Furthermore, the standard deviation in mathematics performance has been on the decline for the last six years implying a decline in performance in KCSE examinations over the years. The formidable problem currently facing mathematics education in Kenya is therefore the need to improve the students' performance in mathematics (KNEC report, 2008).

Table 1:K.C.S.E Mathematics Examination Results Analysis for 2002-2007

Year	Candidature	Mean score	Standard deviatio
2002	197,118	39.39	37.95
2003	205,232	38.62	36.17
2004	221,295	37.20	35.85
2005	259,280	31.91	31.00
2006	238,684	38.08	35.00
2007	273,504	39.46	39.83

Source: KNEC Report, 2006 and 2008

According to Strengthening of Mathematics and Science in Secondary School Education (SMASSE) Report of 2008, the poor results have been attributed to various causes ranging from lack of learning materials and poor teaching methods to psychological factors like poor attitude towards the subject. To redress these causes, the Ministry of Education and other stakeholders have embarked on various large-scale capacity building seminars and workshops that are aimed at strengthening the teaching of mathematics and the sciences in Kenyan secondary schools. In 1998, Strengthening of Mathematics and Science in Secondary Education (SMASSE) was piloted in nine the former 65 districts.

In 2003, the programme was implemented nationwide with the hope of solving pedagogical issues that have contributed to poor performance in mathematics and science subjects over the years. The government has also allocated grants to public secondary schools for the purchase of basic resources like textbooks. The Ministry of Education also introduced the use of scientific calculators for instruction and examination of candidates at KCSE aimed at enhancing performance in the subject (Ministry of Education, 2005). All these initiatives are expected to yield outstanding results in the subject in terms of solving perennial problems inherent in the subject. However, the problem of poor performance continues to persist as clearly indicated by the Kenya National Examination Council report (KNEC report, 2008).

In recent years, it has increasingly become evident that the use of computer together with skilful scaffolding by the teacher enhances the learning of science and mathematics and any other areas that are generally abstract or have a high cognitive demand for the students (Cox, et al, 2001). According to many researchers including Polonoli (2001) and Goddard (2002), public perception also has it that the computer represents both an excellent curricula tool and revolutionary classroom approach that can help students to realize important gains in learning and understanding of mathematical concepts. It is thus viewed as a powerful and realistic tool for the classroom and as having the potential of making teachers' work easier and more efficient (Pelgrum, 2001; Kozma and Anderson, 2002; Makau, 1990). Furthermore, they help the student become less dependent on the teacher as a source of expertise.

African nations have begun designing new policies and investing large sums of capital aimed at integrating computers into the classrooms. In Kenya, the effort is to develop human resources capable of promoting industrialization by 2030 through the use of Information and communications Technology (ICT) in education and training (National ICT policy, 2006). This initiative was published in Sessional Paper No.1 of 2005 where Information and Communication Technology (ICT) in education is given prominence. A specific target was to equip secondary schools and other learning institutions with ICT and adapt their curriculum to meet challenges of information society. To achieve these, every educational institution, teacher, learner and respective community should be equipped with appropriate ICT infrastructure and skills needed to benefit from ICT knowledge- based economy by 2015. Teaching and learning

should be transformed to incorporate new pedagogies that embrace ICT and that are appropriate for the 21st century.

Achievements so far include: equipping of over 450 secondary schools with computers and provision of Kenya shillings 213 million by the government to 142 secondary schools to purchase computers. The Minister for Education in a recent forum on ICT (International Conference on ICT Development, Education and Training e-learning in Africa, 2007) noted that 288 rural public secondary schools will be supplied with electricity. This will be a first step towards integration of computers in the education sector. Education and Energy ministries in conjunction with the government of Finland have also embarked on a program to supply rural public secondary schools with power and internet connection (International conference on ICT development, education and training e-learning in Africa, 2007).

In addition, a unit has been established at the Kenya Institute of Education (K.I.E) to provide overall leadership in digital content, development and delivery. Resources are being mobilised to address digitalisation of the entire curriculum (Ministry of Education, 2006). However, e-content is now available and curriculum innovation centre was launched at K.I.E in March, 2010 for purposes of enhancing curriculum delivery (www.icwe.co.ke/elearn2010). All these reflect the seriousness with which the government treats inclusion of ICT in classroom instruction. While acknowledging the availability of e-content and recent launching of curriculum innovation centre at K.I.E, this shifts the challenge from e-content availability to training teachers to integrate computers in teaching.

According to Kenya ICT 4E situational analysis (2009) the following achievements have also been realized: M.O.E again disbursed Ksh1.5 million to 213 schools evenly distributed across the country to be used to acquire 25 new computers per school, 1 printer per school, educational software and sensitize ICT teacher on technical maintenance. Computers for Schools Kenya (CFSK) reported to have installed 18,000 computers in over 600 schools with 20 computers per school. The ICT Trust Fund has provided 200 schools with 20 computers each. The NEPAD e-schools project provided 6 schools with 20 computers each. The Rural School Project has provided 4500 computers to a number of unidentified schools. Overall, the analysis indicated that 15,450 computers have been disbursed to 1300 secondary schools out of over 4000 schools. Although the project improved teacher's ability to use basic computer programmes and their confidence in doing so, further training, more in-school support and more access to digital content were still needed (Kinyanjui, 2004).

The private sector will be involved in the provision of laptops with the ICT integration team providing specifications and ensuring quality of laptops with the wider ICT integration agenda. Loans will be availed for laptop acquisition and subsequently recovered through check off system by Teachers Service Commission (T.S.C). The purpose is to encourage teachers to use modern and dynamic educational tools (Kenya ICT 4E Situational Analysis, 2009). While acknowledging the government effort, simply deploying computers to schools will not automatically lead to computer integration into teaching and learning. Effective integration will depend on a larger extent trained and supported teachers (UNESCO, Bangkok, 2003). The greatest challenge of the schools therefore has been the provision of adequate support to teachers in as far as acquisition of appropriate technical skills important for integrating computers in the classroom instruction is concerned.

Despite the aforementioned efforts and the fact that ICT increases access to instructional material and several advantages to teaching, computers in many schools are under-used and as such the potential of computer technology is not being realized (Abrami,2001; Muir-Herzig,2004; Sutherland et al., 2004). While developed countries have reported up to 41% of integration of computers in instruction, the proportion remains substantially low in Africa (National ICT strategy for Education, Training and research, 2006. The ICT strategy adopted by

the Kenyan government did not take into consideration teachers' reaction and attitudes to these new tools.

1.1 STATEMENT OF THE PROBLEM

Many efforts have been made by the government of Kenya to improve the declining performance in KCSE mathematics examinations. This has included initiatives such as in-servicing of mathematics teachers through "Strengthening of Mathematics and Science Education (SMASSE) project and introduction of the use of calculators in the teaching and learning of mathematics. Besides, the Ministry of Education has launched a national ICT policy to integrate computers in classroom instruction.

An effort has also been made to introduce computers in secondary school curricula including mathematics instruction in some schools (Kenya ICT 4E situational analysis, 2009). However, the current situation in secondary schools is that computers in schools are widely used for teaching the acquisition of computer literacy skills and computer studies as an examinable subject (Omari and Mosha, 1987). However, little effort has been made to help teachers of other subjects to acquire the skills (Otieno, 2003) and attitudes (Yuen and Ma, 2001) necessary for integrating computers in teaching and learning. Poor performance in K.C.S.E mathematics examinations in the Kakamega South district has therefore persisted as indicated by the KNEC report, 2008 (Table 1). It is against this backdrop of the use of computers and preparedness of teachers that the researchers felt the need to investigate teacher related factors influencing use of computers in mathematics instruction.

1.2 PURPOSE OF THE STUDY

The present study strived to investigate teacher related factors influencing the integration of computers in mathematics instruction in secondary schools in the Kakamega South District of Kenya. The focus was on whether mathematics teachers in the district were using computers in teaching mathematics and if not whether lack of computer technical skills and attitude had a role in the process. The specific objectives of the study were to determine the technical skills acquired by the mathematics teachers that are necessary for instruction using computers and to determine teachers' attitudes towards the use of computers in mathematics instruction.

2. METHOD AND MATERIALS

The study was conducted in the Kakamega South District in Kenya. The study adopted an exploratory descriptive survey design. This design was deemed appropriate as it enabled the researcher to reach as many respondents as possible within a short time.

The target population was 77 public secondary schools with a total of 228 mathematics teachers. Purposive sampling was used in selecting 25 schools. The schools selected were those that had computers and offered computer studies as an optional subject. A total of 147 mathematics teachers (43 female and 104 male) representing 32.5% of the total number of teachers in public secondary schools in the district were selected from the schools. The 147 mathematics teachers were then stratified into gender. Stratified sampling was used to avoid gender disparity. Simple random sampling was then used to pick 30% of respondents in each stratum giving a total of 74 students who participated in the interviews. This was to ensure that each respondent got equal and independent opportunity to participate in the study.

Data were collected to find out the computer technical skills required by the mathematics teachers that would help them use computers in mathematics instruction. Data collection instruments were questionnaires, checklist and interview schedules. The reliability of these instruments was determined by use of the split half method in the pilot study. The correlation coefficients of between 6.5 and 7.6 were obtained for the instruments indicating their acceptable reliability. Data collected were analyzed using descriptive statistics such as frequencies, means, and standard deviation. The results were presented using tables and figures.

3. RESULTS AND DISCUSSIONS

The results are presented thematically based on the objectives of the study; the discussions of the results are also given making reference to relevant studies in the literature.

3.1 COMPUTER TECHNICAL SKILLS REQUIRED BY MATHEMATICS TEACHERS

The researcher sought to find out from the respondents whether they had any training on how to integrate computers in mathematics classrooms during their pre-service course. The results indicated that the majority of the teachers (96.6%) did not have any training while a paltry proportion (3.4%) agreed they received the training. It is therefore not possible for the majority of these teachers to use computers in teaching and learning of mathematics. These results are consistent with Wetzel et al (1996) and Ertmer (2005) who assert that the lack of pre-service and in-service training and support is the main reason why teachers are not using computers in their teaching practice.

It was therefore found necessary to establish if in-service training was necessary to enhance the use of computer technology in mathematics teaching. The majority (95.3%) of the teachers agreed that in-service courses for mathematics teachers in computer skills were useful for instructional purposes. These results coincide with the International Society for Technology in Education (2002) who asserts that relevant technology knowledge and skills are a prerequisite for teachers' effective use of computers in the classroom.

The respondents were then asked if they had attended in-service training in use of computers to teach mathematics. The majority (78.9%) of the teachers had never attended in-service computer courses while only 21.1 % of the teachers had attended the in-service computer courses. Besides, teachers were asked to indicate the computer courses attended during the in-service or type of training, date attended the organizer and theme of the workshop.

From the responses the researcher used the themes of the workshops to make a summary of areas of emphasis that the said workshops addressed. The results were as summarized in Table 2.

From the results in Table 2 most teachers (78.9%) did not attend any in-service computer workshops while 15.7% of the workshops addressed computer literacy or attainment of basic computer skills, followed by courses on ICT and classroom integration in mathematics teaching (3.4%). The findings indicate that majority of mathematics teachers in the selected schools lacked the computer technical skills that would enable them use computers in teaching and learning mathematics. An interesting aspect that was highlighted included those workshops organized by Ministry of Education and Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA) in 2008. Both organizers put emphasis on ICT integration into classroom instruction.

Table 2: Summary of Themes of In-Service Computer Workshops

TYPE OF TRAINING	NO. OF TEACHERS	PERCENTAGE
No computer in-service training at all	116	78.9
Computer literacy skills	23	15.7
ICT and classroom integration into mathematics	5	3.4
Others-computer marketing, engineering Repairs and Maintenance	3	2
Total	147	100

Source: Field data

The results show that the Ministry of Education and other stakeholders in the education sector are concerned with the issue of computer integration in the classrooms, an indication that a gap exists.

These results are consistent with Milner (1980), Keating and Evans (2001), Kadevijech (2002), Staub and Stern (2002), Hughes (2005), McNaught (2006) and Mueller et al (2007) who argue that, due to lack of training and experience, even when computers are available, mathematics teachers rarely used computers in their educational practice. However, from the results the courses attended focused on computer literacy. Computer literacy skills may not help teachers use computers in their teaching practice. This is consistent with the Milken Exchange on Education (1999), ISTE (2002), Wilson (2003) Ertmer (2005) who argue that teacher training programs in general, do not provide teachers with the kinds of experiences necessary to prepare them to use computer technology effectively in their classrooms.

Muriithi (2005) contends that where teachers have been trained in the use of ICT, the integration of computers in the teaching of subjects has been weak because of lack of integration into the existing curriculum and textbooks, lack of computer-based materials that are interactive for teachers to use, the absence of systematic management support and teacher overload as well as lack of incentives and motivation.

This implies that effective educational uses of educational computer technology need more than simply basic computer literacy. To have an impact, the introduction of computers into secondary schools needs to be accompanied by effective professional development in terms of content and delivery.

Regarding the extent to which the teachers used computer technical skills in teaching mathematics, there was a need to find out the teachers' level of competence in computer technical skills. It was also necessary to establish whether they were trained in the use of computers in mathematics instruction or whether they needed training in the same. In order to rate the mathematics teachers' level of competence in computer technical skills, a 5-point numerical scale was used ranging from Excellent 5;Good 4;Average 3;Poor 2 or Very poor 1. A mean score of above 3 denoted adequate computer technical skills; a mean score of 3 denoted average competence in computer technical skills; while a mean score of below 3 denoted inadequate skills. For analysis purposes, frequencies and percentages were then used to determine teachers who required training in computer integrated mathematics curriculum. The results are summarized in Table 3.

From the results in Table 3 it can be seen that almost all the means were below 3. Besides, the mean of the means indicated a value of 2.7220 confirming that the mathematics teachers in the District lacked computer technical skills to enable them use computers in mathematics instruction. This is because the majority of the mathematics teachers do not even

have proficiency in basic computer applications like multimedia, database programmes, spreadsheet and WWW skills and yet for them to use computers effectively in teaching mathematics their training should go beyond these basic skills. These results coincide with Milner (1980), Carvin (1999), ISTE (2002), Kadevijech (2002), Staub and Stern (2002) and Wilson (2003) who argue that in order for teachers to implement computers in classroom instruction, their training should go beyond proficiency in basic computer applications like word processing, database, spreadsheet, and graphic software to professional training in the computer curriculum integration.

In addition to indicating their level of competence in computer technical skills, mathematics teachers were also asked to indicate whether they required any training in the specific computer technical skills. A majority indicated they did and pointed out that they needed training in: graphic skills (89.4%); multimedia skills (86.4%); spreadsheet skills (81.0%); WWW skills (84.4%); word processing (74.8%); problem solving skills (83.7%); database programmes (94.6%); and software evaluation (95.9%). Training would enhance their capacity in integrating computers in their teaching practice. The findings support the work of Bryom (1988), NCES (1999), Baylor and Ritchie (2002), Wilson (2003), Demetriadis et al (2003) and Ertmer (2005) who assert that professional development in computer-integration is a prerequisite for use of computers by the teachers in their classrooms.

On rating of the respondents' level of competency in computer technical skills for the purpose of teaching mathematics, the results were summarized in Table 4. The results in Table 4 indicate that only a paltry proportion (21.6%) of the teachers thought they had the necessary computer technical skills. A majority (78.4%) thought that they were ill- equipped with computer technical skills. Even those who had adequate skills (3.4%) hardly used computers in mathematics instruction. This could be partly explained due to teachers' attitudes, lack of integrated mathematics curriculum and inadequate computers in their schools. These results are consistent with Newhouse (1998) who surveyed 60 Australian teachers and found that even when they had the technical skills; teachers were reluctant to implement technology in the classroom. He further argued that mathematics teachers were not convinced about the benefit of computers in mathematics instruction and preferred traditional methods of instruction.

Table 3: Frequencies, Percentages and Means Indicating Level of Competence of Computer Technical Skills and Need for Training among Teachers

Skills	Good	Average	Poor	Mathematics teachers who require Training In computer use	Mathematics teach already trained in of Computers in teaching of mathematics	Mean of computer technical skill
Graphic Skills	36 24.5%	22 15.0%	89 60.5%	132 89.4%	15 10.6%	2.695
Multimedia Skills	38 25.8%	26 17.7%	83 56.5%	127 86.4%	20 13.6%	2.6939
Spreadsheet Skills	56 38.1%	18 12.2%	73 49.7%	119 81.0%	28 19.0%	2.8844
WWW skills	51 34.7%	21 14.3%	75 51.0%	124 84.4%	23 15.6%	2.8367
Word Processing	71 48.3%	23 15.6%	53 36.1%	110 74.8%	37 25.2%	3.1224
Problem solving skills	55 37.4%	22 15.0%	70 47.6%	123 83.7%	24 16.3%	2.8980
Database Programmes	23 15.6%	15 10.2%	109 74.2%	139 94.6%	8 5.4%	2.4150
Software Evaluation	12 8.2%	18 12.2%	117 79.6%	141 95.9%	6 4.1%	2.2857

Source: Field data

Table 4: Mathematics Teachers Rating Of Level of Competency in Computer Technical Skills

Statement	Number of teachers	Percentage (%)
Excellent	4	5.4
Good	12	16.2
Poor	33	44.6
Very poor	25	33.8
Total	74	100.0

Source: Field data

3.2 TEACHERS' ATTITUDE TOWARDS THE USE OF COMPUTERS FOR MATHEMATICS TEACHING

Mathematics teachers were first of all asked to give their professional opinions about the use of computers in teaching and learning mathematics using the Likert Scale. To analyze data on teachers' attitudes, the Likert Scale was scored as follows:6, Strongly Agree (SA); 5,Agree (A); 4,Nuetral (N); 3,Disagree (D); 2, Strongly Disagree (SD): 1 for positive statements while for negative statements the scoring procedure was reversed. A mean score of above 3 denoted a positive attitude, while a mean score of 3 denoted neutral perception. A mean score of below 3 denoted negative attitude.

The results of the data analysis revealed that the attitude of mathematics teachers was above the mean of 3. This implied that the majority of them had a positive attitude towards the use of computers in mathematics instruction, an indication that mathematics teachers in Kakamega South District see the computer as a tool that can enhance the teaching and learning of mathematics. However, despite the positive attitude one question fetched the lowest mean of 3.034 were those who agreed (44.2%) were almost similar to those who disagreed (45.6%). This implies that the teachers were undecided on whether use of computers would cause students to lose basic computational skills. This may have been due to lack of skills and knowledge by the teachers on the potential of computers in mathematics instruction. These results are consistent with other similar studies by Koohang (1989), Selwyn (1997), Dexter et al (1999), Baylor and Ritchie (2002) and Otieno (2003) who assert that teachers who willingly accept and incorporate new ideas, changes and reforms into their practices are more likely to integrate computer applications in their teaching practice successfully than their counterparts who resist such.

Similarly, ISTE (2002), Demetriadis et al (2003) and Angeli and Valanides (2005) argue that teachers who feel computers are appropriate tools for promoting students learning also engage their learners in the use of computers more than teachers who do not feel computers are appropriate tools for student learning. In developing nations like Kenya, the issue of access to and use of hardware and software is still a problem to address (Sanya, 2001; Adhola, 2004) while individual differences in beliefs, attitudes among teachers are the key area of interest for researchers today (Dexter et al, 1999; Zhao et al, 2002. Having found out that the mathematics teachers' attitude towards computer technology use was positive, it was necessary to find out how frequently they used computers. The teachers' responses were as summarized in Table 5.

The results in Table 5 showed that most of the teachers (59.2%) do not use computers in their day to day activities. Only 17.7% used computers once a week, 12.9% used computers more than once a week and 10.2% used computers every day. As noted in the literature these findings coincide with previous correlation studies which have long forecasted that the use of computers in teaching and learning of mathematics would very much depend on how well

teachers integrate them in everyday activities (Loyd and Loyd, 1985; Kluever et al., 1994; Yuen and Ma, 2001; Hsiung, 2001).

Table 5: Frequency of Computer Use by Mathematics Teachers

Frequency of use	Number of teachers	Percentages (%)
Everyday	15	10.2
Once a week	26	17.7
More than once a week	19	12.9
Not at all	87	59.2
Total	147	100.0

Source: Source: Field data

Similar studies have shown a correlation between frequency of computer use and teacher's attitudes towards use of computers in their mathematics classrooms (Hawkins and Oblinger, 2006). However, it can also be concluded that although the mathematics teachers in the Kakamega South District have not embraced the use of computers in the classrooms, there is the pervasive use of computers in their daily and personal lives. Inevitably such developments need to be reflected in our schools. The objective was further emphasized in the face-to-face interview with 74 teachers regarding the difficulties anticipated if computers were integrated in mathematics curriculum. The responses of the respondents were as presented in Table 6.

Table 6: Teachers' Opinions on Difficulties in Use of Computers In Mathematics Instruction

Statement	No. of teach	%
Lack of appropriate skills	47	63.5
Lack/inadequate comput or infrastructure	10	13.4
Lack of integrated syllabus	1	1.4
Rigidity/resistance teachers	12	16.2
Lack of electricity in m schools	1	1.4
Cost of maintenance	3	4.1
Total	74	100.0

Source: Field data

Table 6 reveals that the majority (63.5%) of teachers lacked computer technical skills that would help them use computers in teaching and learning mathematics. These findings confirm the work of Staub and Stern (2002); Otieno (2003) and Bain McNaught (2006) who posit that computer skills and knowledge determine use of computer technology in the classroom. Other important difficulties included: Resistance (16.2%) to the new approach; lack of computers and the necessary infrastructure (13.4%); cost of computer maintenance (4.1%); lack of electricity (1.4%); and lack of integrated syllabus (1.4%). These barriers are well documented in the literature. For example, teachers prefer traditional methods that are familiar and known to produce results than fumble with 'unknown technology' (Hazzan , 2000 and NCES , 2000) while Sanya (2001) and Adhola (2004) argue that the availability of electricity is limited mainly to urban areas in contrast to the location of 75% of public secondary schools in Kenya in rural areas. The lack of integration syllabus is perhaps the most significant barrier although only a few teachers identified it. According to Office of Technology Assessment (1995), lack of standard of integration is a factor that influences use in classrooms. Although computers are in schools and teachers are being encouraged to integrate computers with

mathematics, there is no universal definition of what integration of technology with mathematics means or what an integrated curriculum looks like. However, the recent launch of e-content by K.I.E and launching of curriculum innovation centre at K.I.E for purposes of enhancing content delivery may shift this challenge of training of teachers in the use of computers, computer integration across the other subjects and infrastructure development in the schools.

Having identified the difficulties experienced by the mathematics teachers, respondents were further asked to say if they were willing to use computers in mathematics instruction. The findings also showed that out of the 74 teachers interviewed, most teachers (95.9%) were willing to use computers in instruction with very few (4.1%) not willing to use computers in instruction. Furthermore, teachers were asked to say why they were willing to use computers in mathematics instruction. Their responses were summarized in Table 7.

The findings in Table 7 indicate that most mathematics teachers (81.1%) believed that the use of computers in teaching mathematics enhanced performance in mathematics instruction .The reasons cited included: teaching is made easier/effective/efficient; learning is interesting; learner friendly/enjoyable/simplify abstract concepts; cater for individualized instruction; provides hands on experiences vary stimuli; and computation. For those teachers who were not willing to adopt the use of computers in instruction their responses were as follows: computer use was considered extra workload, feared that learners will not think and they may lose basic computational skills (4.1 %).

Table 7: Reasons Why Teachers are willing to Adopt Computers in Mathematics Instruction

REASONS FOR WILLINGNESS TO USE COMPUTERS	No. of teachers	%
Method that will enhance teaching/learning mathematics e.g. teaching easier/efficient/effective and learner- centred approaches	60	81.1
Adopting new and modern pedagogy a must since it is more effective than traditional methods	17	23.0
Change students attitude towards mathematics		1.4
Total	77	100

Source: Field data

4. CONCLUSIONS

Several conclusions can be made from the results of this study. First, the study established that mathematics teachers in Kakamega South District lacked appropriate computer technical skills necessary for them to use computers in mathematics instruction. Baylor and Ritchie (2002) argue that regardless of the amount of technology and it is sophistication, technology will not be used unless the teachers have the skills, knowledge and attitudes necessary to use computers in classroom instruction. There is therefore need to train teachers in computer technical skills to enable them use computers in mathematics instruction. Second, mathematics teachers in the Kakamega South District have a positive attitude towards the use of computers in their teaching practice. Based on the findings, it is clear that even with the positive attitude towards the use of computers, the lack of computer skills hamper the use. Third, computer access determines mathematics teachers' use of computers in Kakamega South District schools. This is in addition to other barriers such as lack of electricity and computer infrastructure.

5. RECOMMENDATIONS

From the findings outlined, the following recommendations are reached:

a) Teacher training institutions should offer professional training in the use of computers in mathematics instruction.
b) Mathematics teachers that have the relevant professional skills on how to use computers in mathematics instruction should play a central role in developing the integrated K.C.S.E curriculum in collaboration with curriculum developers (K.I.E).
c) The government should organize seminars and workshops for mathematics teachers to provide relevant professional training in the use of computers in mathematics teaching and learning.

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