Mitigating Factors, and Factors Militating against Teacher's Utilization of ICTs in Their Classrooms in Kenya's Secondary Schools

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Abstract: **This study highlights on the findings of a survey study which was done in some schools within one of the sub-counties in Kenya. Evidence has been collected through a literature review, teacher questionnaires and interviews. The main purpose of this study was to investigate the existing factors that support or hinder teachers from utilizing ICTs in their classrooms despite having them. This study was guided by the theory of Technology acceptance model by Davis, Bagozzi and Warshaw, (1989).The study reviewed literature on the importance of the use of ICTs in teaching and learning. Descriptive survey is the framework that guided the study. The study area is Kericho County in Kenya. Analysis of data was done thematically to exhibit the attitudes, values and views of the teachers concerning the usefulness of ICTs in teaching and also the factors that hinder utilization ICTs. Descriptive statistics was also used to analyze data from questionnaires. The literature analyzed shows that ICTs are very important in the following areas: they make the lessons more interesting, easier, more fun for teachers and their pupils, more diverse, more motivating for the pupils and more enjoyable. Additional more personal factors were improving presentation of materials, allowing greater access to computers for personal use, giving more power to the teacher in the school, giving the teacher more prestige, making the teachers' administration more efficient and providing professional support through the Internet. The findings from this study reveals that factors hindering the utilization of this precious teaching materials includes, lack of clarity in the use of this ICTs in the curriculum, time factor, incompetence among the teachers on computer skills, overreliance on traditional methods of teaching and resistance to change.**

Keywords: **Information communication technology, perceived usefulness, perceived ease of use, pedagogy.**

1. INTRODUCTION

The most influential needs currently in the field of education is mainstreaming or integration of information communication technology (ICT) into teaching and learning in schools. This is due to the fact that modern educational information communication technologies, which encompass largely computers, have great potential to improve and transform learning in secondary education. This potentiality include improving the clarity and comprehensibility of communication in classroom, providing mechanism for greater individualization in learning, implementing curriculum reforms, enhancing the application of new learning to daily life and increasing instructional productivity of schools. To realize the Kenya's dreamland of vision 2030 through the element of education, no can do that without the emphasis on introduction of ICTs in schools.

The integration of learning technologies into high school classrooms is being promoted and supported around the world. Underlying the promotion and support are claims that successful integration will lead to enhanced learning outcomes (UNESCO, 1998). Fox (2005) stated that technology is being fused into the schools and its ongoing is unstoppable, and necessary. The puzzling question is: Where is Kenya in this thinking?

Thus school use and access to the new and current technologies is on the rise and more countries have established technology standards for students, teachers and administrators.

The following prominent researchers in the use of educational technologies in instruction (Fulton, Teldman, Spitzer, Rubin and Namara, 1996) believe that technology has the following potentials in the learners as cited in (UNESCO 1997).

- Open the classroom to more communication opportunities

- Encourage more teacher-student and student- student discussion.

- Share the authority as more resources are brought into the classroom.

- Create opportunities for tasks that are complex and authentic and connected to projects which may be multidisciplinary and long term.

- Give students more opportunities for multiple ways of discovering, creating and communicating information in various format and voices.

Technology today is turning the whole world into a global village. Unless the training of teachers put emphasis on the modern technology, they will be overtaken by the events. Studies by Ogoma (1987), Oslon (1992), Odanga (2000) observed that a good number of institutions have acquired computers, television, video-tapes, telephone lines recorders among others but they have not used them for instructional purposes.

Statement of the problem:

Based on the above highlighted background to this study, one would expect every country to take the introduction and mainstreaming of information communication technology into its curriculum seriously. I usually get perplexed to see parents in our country taking their children after form four to so many mushrooming computer colleges to learn basic skills that one would expect that they should have learn in high schools. I also teach in the university and I normally see first years students struggling to enroll in computer colleges which have realized the serious need by the students to learn the computer skills. Based on the studies by Ogoma (1987), Oslon (1992), Odanga (2000) they observed that a good number of secondary schools have acquired computers but they have not used them for instructional purposes. Why availability without the use of computers? This is what puzzled me to conduct this study.

Objectives of the study:

This particular research was expected to achieve these objectives**:**

i) To examine the factors limiting the utilization of information communication technologies in teaching in Kenya's secondary schools.

ii) To investigate factors in support for the use of ICTs in the teaching and learning in Kenyan secondary schools

iii) To explore the contributions of using ICTs to teaching in secondary schools.

Theoretical framework:

This study was guided by the theory of Technology Acceptance Model (TAM).

Technology Acceptance model (TAM):

The Technology Acceptance Model (TAM) is an information system theory that models how user comes to accept and use a technology. The model suggests that when users are presented with new software package a number of factors influence their decision about how and when they will use it, notably:

Perceived Usefulness (PU) - this was defined by (Fred Davis1988) as the degree to which a person believes that using a particular system would enhance his or her job performance.

Perceived Ease of Use (PEOU)-Davies defined this as the degree to which a person believes that using a particular system would be free from effort (Devis, 1989).

- TAM is one of the most influential extensions of Ajzen and Fishbein's (1980) Theory of Reasoned Action (TRA) in the literature. It was developed by Fred Davis and Richard Bagozzi (Bagozzi, 1992; Devis, 1989).TAM replaces many of TRA's attitude measures with the two-technology acceptance measures namely ease of use and usefulness. TRA

and TAM, both of which have strong behavioral elements assume that when someone forms an intention to act, they will be free to act without limitation.

Davis, Bagozzi and Warshaw (1989) developed this theory of 'action relating to reasons' (Technology acceptance model) based on the work of Fishbein and Ajzen (in Davis et al, 1989) to investigate the reasons why some people use computers and their attitudes towards them. Their model, shown in Figure 1, links the perceived usefulness and ease of use with attitude towards using ICT and actual use (system use). They tested this model with 107 adult users, who had been using a managerial system for 14 weeks. They found that people's computer use was predicted by their intentions to use it and that perceived usefulness was also strongly linked to these intentions.
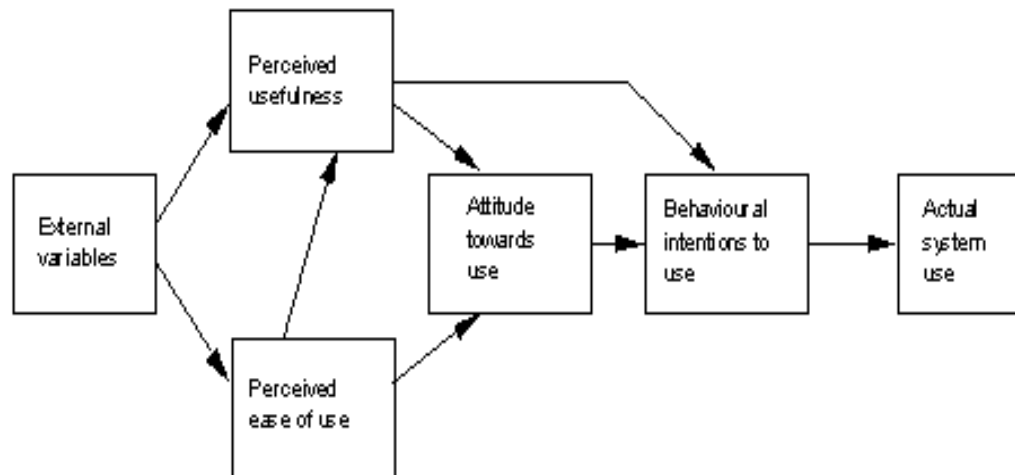

Figure 1 - Technology acceptance model (Davis, Bagozzi and Warshaw, 1989)

The TAM theory further explain that In the real world there are many constraints, such as limited ability, time constraints, environment or organizational limits or unconscious habits, which will limit the freedom to act. Because new technologies such as personal computers are complex and element of uncertainty exist in the minds of decision makers with respect to successful adoption of them/ people form attitudes and intentions toward trying to learn to use the new technology prior to initiating efforts directed at using. Attitudes towards usage and intentions to use may occur only after preliminary striving to learn to use the technology evolved. Thus, actual usage may not be a direct or immediate consequence of such attitudes and intentions.

 Rogers (1995) explained that the following are the five characteristics of User Acceptance of Information Technology (U.A.I.T):

- Relative advantage (the extent to which it offers improvement over available tools.

- Compatibility (its consistency with social practices and norms among its users).

- Complexity (it ease of use or learning.

- Triability (the opportunity to try an innovation before committing to use it.

- Observability (the extent to which the technology gains are clear to see).

This theory was very relevant to this study particularly during the investigation of the reasons why people fail to use available resources.

2. CHARACTERISTICS OF ACCEPTING USERS

Many researchers have attempted to identify psychological variables that distinguish users who accept or reject technologies. In a Meta-analysis of research, (Alavi and Joachimsthaler, 1992) suggest that the most relevant user factors determining technology acceptance are Cognitive Style, Personality, Demographics and users situational variables.

This theory is supported by Shadel Joachmisthaler (1992), Rogers (1995), and Davies (1989) among others. Numerous diffusion studies have demonstrated that innovations affording relative advantages compatibility with existing practices and beliefs low complexity, potential triability and observability will extensively and rapidly accepted than an innovation with the opposite characteristics. This model guided this research and found out possible reasons behind failure to acquire and use the modern educational technologies in our schools to enhance instruction.

3. LITERATURE REVIEW

Importance of using ICTs in classroom:

Bruce and Levin (2001) suggest that technology can be helpful in classroom setting by encouraging inquiry, helping communication, constructing teaching products, and assisting students' self-expression (cited in Baek et al (2008).Bransford, Brown, and Cocking (2000) refer to five very important roles that technology can play in education:

- bringing the whole world experiences into classroom,

- providing scaffolding that allows learners to participate in complex cognitive tasks,

- increasing opportunities to receive sophisticated and individualized feedback,

- building communities of interaction between teachers, students, parents and other interested groups, and expanding opportunities for teacher development

For several years, there have been research studies locally and internationally in the uptake of ICT in education. These include studies of the effects of teacher training (Cox, Rhodes & Hall 1988), levels of resources (Cox, 1993), teachers' pedagogies and practices (Watson, 1993), and teachers attitudes (Woodrow, 1990) and on effective training of primary school teachers on ICT in Kenya (Abenga,2005). For detailed research papers on many of these aspects see Passey and Sam ways (1997). Many of these studies have shown that in spite of teacher training programmes, an increase in ICT resources and the requirements of national curricula there has been a disappointingly slow uptake of ICT in schools by the majority of teachers. Some of the reasons for this lack of more widespread uptake of ICT are discussed in more detail below.

Understanding the need for change:

Fullan (1991) found that one of the most fundamental problems in education reform is that people do not have a clear and coherent sense of the reasons for educational change, what it is and how to proceed. Thus there is much faddism, superficiality, confusion, failure of a change programme, unwarranted and misdirected resistance and misunderstood reform. They maintain that teachers who resist change are not rejecting the need for change but they are often the people who are expected to lead developments when they lack the necessary education in the management of change and are given insufficient long term opportunities to make sense of the new technologies for themselves.

Reflection professional practices:

Reflective teaching is a process where teachers take a solemn time to think over their teaching practices. This involves seriously analyzing how a particular content was taught, how it was communicated and what opportunities are there for future improvement. It also involves talking with colleagues about it. This however in the short run. In the long run it involves questioning our practices based on our initial training. Was the initial training enough? Do we need some reengineering? There are many studies which have shown that teachers are "not given to questioning their professional practice" (Underwood, 1997). Once they have finished their initial training they do not expect to need much further training therefore do not take the initiative to improve their practice and learn new skills. Desforges (1995), in a literature review of the shift from novice to expert teachers, found that "many teachers are perfectly well satisfied with their practices and are unlikely to question prevailing educational processes" (Feiman-Nemser & Buchanan (1985) in Desforges (1995). In order for teachers to make changes to their professional practice, according to Desforges "a considerable effort is necessary to create the possibilities of restructuring knowledge (about teaching and learning) in the face of experience..... In regard to old knowledge we can speculate that the impact of new experience (e.g. using ICT) will be severely attenuated if it is in conflict with teachers' basic ontological categories, e.g. their beliefs about the nature of

their job or the nature of childhood". Therefore if teachers see no need to change or question their current professional practice they may not accept the use of ICT in their teaching. Also if the teachers fail to reflect daily on their day to day practices, they might fall into a status quo.

Pedagogical practice versus technical skills:

Pedagogy is related to how teachers teach, and the strategies they use in their work - See more at: http://www.tabletsforschools. It is important to note here that teachers are best placed to engage in effective pedagogical practices when they can completely select wisely and use effectively quality and appropriate resources based on the current needs. In today's world what is driving a change in pedagogy and teacher education programmes includes emerging technology,changes in the society and high expectations in our society. Previous studies (Cox et al, 1988, Cox, 1994) have shown that until recently the majority of courses offered in the UK to train teachers in the uses of ICT have focused on the technical aspects of ICT with little training about the pedagogical practices required and how to incorporate ICT in the curriculum. In many ICT professional development courses, teachers are not often taught how to revise their pedagogical practices, how to replace other traditional lessons without depleting the curriculum coverage and so on. This means that after teachers had attended a course they still did not know how to use ICT for teaching pupils, they only knew how to run certain software packages and to fix the printer. There were many such courses offered all round the UK which had very little long term impact on the uptake of ICT in schools.

ICT IMPLEMENTATION PITFALLS:

Fullan and Stiegelbawer, (1991) indicate the following reasons as the major barriers to successful implementation educational technology .That when;

- The purpose is not made clear.

- The participants are not involved in the planning process.

- The appeal is based on personal reasons.

- The habit patterns of the work group are ignored.

- Communication regarding change is poor.

- There is fear of failure.

- Excessive pressure is involved

- The cost is too high, or the ward for making change is seen as adequate.

- .The present situation seams satisfactory.

- There is lack of respect and trust in the change initiator.

Likewise, there are many factors that affect technology implementation, especially in urban schools (Means, Penuel, and Padilla, 2001:197), including the following:

- Lack of technology infrastructure

- Lack of technical support.

- Teacher discomfort with technology.

- Lack of instructional vision for technology use in schools.

- The constrains of academic schedules and departmental structures.

- Lack of student technology skills.

- Low expectations of students.

- Accountability pressure.

- Communication and leadership pitfalls to implementation.

- Poorly designed implementation plan that fail to define tasks and responsibilities

- Failure to have shared vision, clear goals, and objectives with defined measurable outcomes.

If barriers to implementation are not dealt with, the chances of success for even the best planned implementation is seriously compromised (Means, Penuel, and Padilla, 2001).These are important implementation pitfalls to avoid and barriers to overcome, but there are some problems, which are unique to technology leadership that requires special attention. One of them is the need for professional development for both administrators and teachers. This could be because many educators did not receive adequate preparation in use of educational technology in their pre-service experience.

4. RESEARCH METHODOLOGY AND DESIGN

This section provides a summary of the methods applied in carrying out the research study. This section is organized under the following areas: research design, research site, population, sampling techniques, and research instruments, procedures for data collection and data analysis and presentation.

This study adopted descriptive survey as a research design and indeed it was appropriate, the study took place in 35 secondary schools in one of the sub-counties in Kenya. The target population was 326 teachers including the principals in the 35 secondary schools. Simple random sampling was used to select 50% of the teachers in every school however the principals were selected purposively and therefore all the principals were selected. In total 128 teachers were sampled through simple random sampling and 35 principals in total they were (128+35=163). 120 teachers returned answered questionnaires and 30 principals participated actively in focused group discussions. An opportunity emerged during principals' annual conference whereby the researcher was one of the facilitators so he grouped them into focused groups for discussion on the topic factors for and against the utilization of ICTs in their schools. Both the instruments ware designed to collect evidence from teachers and principals about availability of ICT materials in their schools, their ICT experiences, expertise and use in teaching, their attitudes to the value of ICT for teaching and learning, the training they had received and what they think that they are hindering factors in the utilization of ICTs in the teaching and learning.

 The researcher used the descriptive statistics, which involved the use of frequencies and percentages to analyze the data. The researcher further analyzed the results using SPSS programme. After this, the results were tabulated and presented in frequency tables. It is also worth pointing out here that research ethical considerations were adhered to.

Summary of the findings, conclusion and recommendations:

Findings of the study:

The findings of this study ware based on questionnaires which were designed to respond to the following objectives:

  i. To examine the factors limiting the utilization of information communication technologies in teaching in Kenya's secondary schools.

  ii. To investigate factors in support for the use of ICTs in the teaching and learning in Kenyan secondary schools

  iii. To explore the contributions of using ICTs to teaching in secondary schools in Kenyan secondary schools.

Factors militating against the utilization of ICTs in Kenya secondary Schools:

Analyzed items of the questionnaires which were designed to solicit the information on limiting factors show that the highest percentages ranging from 53%-89% consist of the following factors: Eighty nine (89%) of the teachers are not competent they lack expertise in computer knowledge and skills because they were not trained in basic computer skills in college and they have not been empowered on the same skills and knowledge to date. Seventy six percent (76%) of the teachers also stated that time for them to train and use their ICTs skills interactively in teaching and learning is another limiting factor. Time factor is necessitated by shortage of teachers and high enrolments. Fifty three percent (53%) of the respondents also stated shortage of ICTs materials and maintenance in schools. Sixty percent of the respondents also mentioned that there is no strong government guiding policy presently in place concerning full mainstreaming or

integration of ICTs in teaching and learning in secondary schools. Fifty four percent (54%) of the respondents think that full implementations of ICTs might rob them their jobs as it has happened in other sectors .This resistance to change is basically due to little understanding

Factors mitigating for utilization of ICTs in secondary schools in Kenya:

Though the factors against the integration of ICTs in education in Kenya secondary schools seem to be so prominent, never the less there are a number of support factors that featured in the analysis of the data collected. Results in the analyzed data shows that 90% of teachers have a positive attitude towards training in the use of modern educational information communication. Also 90% of the teachers are aware of the great importance of ICTs in enhancing teaching and learning. Another important finding is that most of the schools have acquired ICT materials such as computers and internet connection whereby they are presently used for administrative purposes. In connection to this, if teachers are empowered in the use of these materials to enhance classroom teaching and learning it will be very important to schools. Another support factor is the present status of electrification .During the time of this research 98% of the secondary schools has sufficient electricity power supply from Kenya power Electricity Company. This use to be a great challenge to the effective installation of ICT materials. Teachers also mentioned that most of the students are enthusiastic for the introduction of computer courses. Interview sessions with the Principals revealed that despite the schools ban on Mobile phones and strict disciplinary measures attached to the same, students still sneak into schools these electronic cachets. Principals stated that students got with the said mobile phones normally argue that they use them to get notes through the internet. In fact the principals said the students are ahead of their teachers when it comes to the use of ICTs .They also observed that there is an urgent need to guide the learners on ethical consideration in the use of ICTs. In contrary to what people normally point out that the ICT materials are expensive, discussions with the principals that the schools presently can acquire the basics which can serve the required purpose to a great extend. The mentioned that it is even possible to mobilize donors and general well wishers to provide free of charge.

Teachers' views in the contributions of ICTs in Education:

The following is a summary of the contributions of ICTs to education in their schools presently:

- Administrative functions-this function include keeping records, setting examinations, storage of software information and analysis of data in their schools,

- Research-they also observed that normally teachers get complementary information from to enhance their teaching materials from the internet.

- Teaching and learning-the respondents also mentioned that they have been using the computers and projectors to enhance teaching and learning of concepts. They said that the use of ICTs clarify concepts, charts and figures. They also make learning more interactive, interesting and simple. All the respondents also mentioned that the effective use and integration of ICTs in teaching and learning has not taken place.

5. CONCLUSION

In conclusion this study through a review of literature revealed that the use of ICTs in education Open the classroom to more communication opportunities, encourage more teacher-student and student- student discussion ,share the authority as more resources are brought into the classroom, create opportunities for tasks that are complex and authentic and connected to projects which may be multidisciplinary and long term and give students more opportunities for multiple ways of discovering, creating and communicating information in various format and voices.

Today's technology can also offer adolescents a bridge from concrete to abstract thinking enabling them to observe and create multiple representations of mathematical ideas: numerically, graphically, and symbolically. Technology has become a very powerful instructional tool to develop abstract thinking, which should be reflected also in assessment. Moreover technology can supports students' performances of complex tasks that are similar to those performed by adult professionals .Information technology can be integrated into activities that are a core part of the classroom curriculum . Research has also shows that technology is treated as tools to help accomplish a complex task (rather than as a subject of study for its own sake) that engage students in extended and co-operative learning experiences that involve multiple

discipline. Information communication technology has been proved to accommodate learning style and to be effective motivation for students with specific learning needs. Technology promotes collaborative – team learning.

With respect to teachers, educational technologies are very useful to them. Contrary to the opinion that technology might rob teachers their work, instead technology enrich the work of the teachers. This study concludes from its findings that the teachers role such as providing a favorable environment which is in sympathy with the child's level of cognitive and physical development, provision of scaffold for children's problem solving situation, and providing support when the child is in difficulty to select, remember and plan. Teachers also evaluate learners, shape their attitudes and ensure discipline among the learners which machines cannot do. Technology therefore does not replace the teacher it perfects the work of the teacher.

Factors militating against the effective use ICTs in Kenyan secondary school include: teachers' incompetence, lack of expertise in computer knowledge and skills because they were not trained in basic computer skills in college and they have not been empowered on the same skills and knowledge to date. Time for them to train and use their ICTs skills interactively in teaching and learning is another limiting factor. Time factor is necessitated by shortage of teachers and high enrolments in secondary schools. There is also a shortage of ICTs materials and poor maintenance of the available ones. Finally some respondents think that full implementations of ICTs might rob them their jobs as it has happened in other sectors.

Support factors include teachers who have a positive attitude towards training in the use of modern educational information communication. Also teachers are aware of the great importance of ICTs in enhancing teaching and learning and another important finding is that most of the schools have acquired ICT materials such as computers and internet connection however; they are presently used for administrative purposes. Another support factor is the present status of electrification of most of the schools. It was interesting when Principals stated that the students are ahead of their teachers when it comes to the use of ICTs. They also observed that there is an urgent need to guide the learners on ethical consideration in the use of ICTs. In contrary to what people normally point out that the ICT materials are expensive, discussions with the principals reveal that the schools presently can acquire the basics which can serve the required purpose to a great extend. As far as the use of ICTs is concerned in Kenyan context, mostly ICTs are used for Administrative purposes, research purposes to get materials to complement the text books and rarely they are used for teaching and learning purposes.

6. RECOMMENDATIONS

- Empowerment of teachers: secondary school teachers in Kenya should be in-serviced on skills, knowledge and attitudes on effective mainstreaming and integration of current Information communication technologies in the teaching and learning.

- The Kenya government should make strong policy concerning the application of ICTs in education sector, universities and all teacher education colleges .The government should also provide ICT materials to all schools

- Establishment of national centre for the technology: for the teachers in the field, the government should establish a national centre for technology and teachers education that disseminate new knowledge, develops new knowledge, coordinate and recommend new educational technologies and provides refresher courses to already practicing teaching and lecturers.

- Creation of more opportunities for technology access to student: the available technologies should be made more accessible to students to practice the skills of using them during their own free time with assistance from their teachers.

Recommendation for Further Research:

This study is not an end in itself and therefore it recommends that a related research on factors limiting effective use of ICTs in primary teacher education and training colleges in Kenya should be done.

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