

**ASSESS THE SCHOOLS READINESS IN COMPUTER ADOPTION FOR EDUCATION
SUPPORT IN PUBLIC SECONDARY SCHOOLS IN KENYA.**

Mary Molenje (Phd)

School of Education, Moi University.

P.O BOX 415-50204 Kimilili Kenya.

ABSTRACT

Computers can provide a more flexible and effective ways of professional development for teachers to improve pre- and in-service, teachers training and connect teachers to the global teachers community. The purpose of this study was to investigate the teacher perception in computer assisted instruction, adoption for education support, in Kenyan secondary schools. The study sought to address the following objectives; Find out the teachers' attitude towards the computer use and to assess the perceived barriers towards computer instruction. The study adopted the technology acceptance model (TAM) by Davis (1989) which expresses how technology is integrated into the instruction process. Other theories include, Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB). A descriptive survey research design was used. Stratified sampling was used to select One hundred and fifty schools; Purposive sampling was used to select the Head teachers and Simple random sampling was used to select the teachers. A total representative sample of 414 respondents was used. Questionnaires and interviews schedules were used as instruments for data collection. Descriptive statistics such as frequencies, percentages and means was used to analyze the data. The study would benefit teachers, school managers, curriculum planners and policy makers, developers and implementers in coming up with the best integration approaches for the use of computers in teaching and learning in Kenyan secondary schools.

Keywords: *Assess, School Readiness, Computer, Adoption.*

1.0 INTRODUCTION

The educational technology era has arrived accompanied by major changes in both education and technology. Technological innovations and applications are becoming apparent in many facets of the education professions and as Gross (1995) suggested then, technology was set to continue to change rapidly in the following 10-15yrs. School technology became a big business in an attempt to provide the necessary technology to link schools and colleges to the information highway (West, 1995; 1996).

CAI started in the 1950s and 1960s, mainly in the USA. Pioneers for example Suppes (Stanford University), Kemeny and Kurtz (BASIC, 1960s (Kemeny & Kurtz, 1968, 1985) and Bitzer (PLATO, University of Illinois) (Hart, 1981, 1995) were between the first to use a computer as part of the learning process. The early CAI programs were rudimentary by today's standards, with mainly text-based interfaces. Bitzer was one of the first to realize the importance of graphics and sound in the teaching process. Initially, CAI programs simply tried to teach a particular topic without a basis on any particular educational philosophy.

The TICCIT (Time-Shared Interactive Computer Controlled Information Television - (Merrill, 1983; 1988) at the Brigham Young University was based on a specific instructional framework that dictated the actual hardware. The Logo project (Papert, 1980; 1993) was probably the first CAL system that was based on a specific learning approach (the experimental, discovery learning approach). More detail on the history of CALL is given in History (2000) and Levy (1997).

Many studies conducted across the globe on the use of technology in classrooms have reported that computers can be an effective tool in supporting learning and teaching in class, for example,

school net programme in South Africa promotes teaching and learning through the use of computers,(Strydon, 2003) However integration of computers in Pedagogy as a project in 3rd world countries has failed to a large extent than other instructional initiatives in schools (Sanchez &Hueros, 2010).The high rate of failed or in complete ICT projects negatively impacts schools teaching , learning and performance with immeasurable consequences to national development.(Schiiewaert, Ahearne, Frambach , &Moenaert, 2005), Van Raaij & Schepers, (2008).

Kenya is making a remarkable progress in putting in place ICT policy framework and implementation strategy, complete with measurable outcomes and periods. KICD has made great steps in developing Multimedia educational resources in most subject areas .The institute has developed digital content in 12 subjects from form one to form four at secondary level. At Primary school level content for class three to eight has also been developed in Science and Mathematics, The institute is currently developing content for class one and two in all subjects, The institute has further planned to digitalize content in all subjects,(Republic of Kenya, 2005 a).The ministry of Education developed KESSP in 2005 that featured ICT as one of the priority areas, with the aim of mainstreaming ICT into the teaching and learning process, however universal implementation is quite a problem (Farrel, 2007).

Being a global issue, the programmed process involves a paradigm shift where new insights and information facilitates new forms of understanding. Various studies indicate that success in ICT rests on proactive school teachers who would give support to the integration of ICT in school operations, (Davis, 2002:8, Persand, 2006; 23-24, Bowes, 2003).

Over the past years, IT has broadened to become ICT and has become of interest in schools, Hennessey *et al.* (2005), Toarle (2004) reported having embraced computer assisted learning while others were handicapped. Ruthven *et al.* (2004), on factors influencing dissemination and

sustainability of ICT integration in schools cited the teachers role in orchestrating mediating computer based activities requiring a lot of background training and time.

Honey *et al.* (2000) on successful integration of learning technologies into classroom showed that success requires understanding the complex interactions in class between teachers and students and technology. Cope *et al.* (2000) on teacher's perception of learning technologies and teachers influence of student's perception ,indicated that the student's perception being influenced by teacher's perception and use in their approaches.

Hennesseys and Deaney. R.(2004) on sustainability and evolution of ICT supported classroom practices indicated that ICT can provide more flexible and effective ways for professional development of teachers ,connecting them to the global teacher community .Teaching is becoming one of the most challenging profession in the society where knowledge is expanding rapidly and modern technology demands teachers to learn how to use them in their teaching .For teachers to use this tools effectively and efficiently, they need visions of technologies potential opportunities to apply them, training just in time, support and time to experiment .Only then can teachers be informed and be confident in their new technology.(Perraton, Robbinson& Creed, 2001).

1.1 Statement of the Problem

Many studies conducted across the globe on the use of technology in classrooms have reported that computers can be an effective tool in supporting learning and teaching in class, for example, school net programme in South Africa promotes teaching and learning through the use of computers,(Strydon, 2003) However integration of computers in Pedagogy as a project in 3rd world countries has failed to a large extent than other instructional initiatives in schools (Sanchez

&Hueros, 2010).The high rate of failed or in complete ICT projects negatively impacts schools teaching , learning and performance with immeasurable consequences to national development.(Schiiewaert, Ahearne, Frambach , &Moenaert, 2005), Van Raaij&Schepers, (2008).

Kenya is making a remarkable progress in putting in place ICT policy framework and implementation strategy, complete with measurable outcomes and periods. KICD has made great steps in developing Multimedia educational resources in most subject areas .The institute has developed digital content in 12 subjects from form one to form four at secondary level. At Primary school level content for class three to eight has also been developed in Science and Mathematics, The institute is currently developing content for class one and two in all subjects, The institute has further planned to digitalize content in all subjects,(Republic of Kenya, 2005 a).The ministry of Education developed KESSP in 2005 that featured ICT as one of the priority areas, with the aim of mainstreaming ICT into the teaching and learning process, however universal implementation is quite a problem (Farrel, 2007).

Being a global issue, the programmed process involves a paradigm shift where new insights and information facilitates new forms of understanding. The main purpose of the study was to investigate the teacher perception in computer assisted instruction, adoption for education support in secondary schools in Kenya. The study was guided by the following main objective;

- i. To assess the schools readiness in computer adoption

2.0 LITERATURE REVIEW

On the school level, factors such as support, funding, training and facilities influence teachers' adoption and integration of technologies into their classrooms. Teachers' professional development is a key factor to successful integration of computers into classroom teaching. ICT

related training programs develop teachers' competences in computer use (Bauer & Kenton, 2005; Franklin, 2007; Wozney et al., 2006), influencing teachers' attitudes towards computers (Keengwe and Onchwari, 2008) and assisting teachers reorganize the task of technology and how new technology tools are significant in student learning (Plair, 2008).

One of the greatest determinants of school readiness to adoption of ICT in mainstream learning is the school vision and plan on ICT integration. Ertmer (1999) wrote, "A vision gives us a place to start, a goal to reach for, as well as a guidepost along the way". Many researchers have pointed out that a school's ICT vision is essential to effective ICT integration (Anderson & Dexter, 2000). In Kenya most of the educational institutions are far away from implementing ICT into teaching and learning situations. Also, there are few higher educational institutions in big cities that have ICT facilities but cannot integrate it effectively due to lack of a proper vision and plan. So ICT integration is clearly related to actions taken at the school level, such as the development of an ICT plan, ICT support, and ICT training (Tondeur, van Keer et al. 2008) which is absent at most of the educational institutions in Kenya.

Another determinant of the schools readiness in integrating ICT in mainstream learning is the general culture of the school. School culture encompasses the vision, plans, norms and values that are shared by school members (Maslowski ,2001). Focusing on the importance of school culture for ICT integration, Pelgrum and Law (2009) indicated that effective ICT integration depends on the perceptions and vision of school leaders rather than teachers' ICT skills. School culture has a mediating role that influences teachers' actions, beliefs, and attitudes (Chai, Hong and Teo 2009). Therefore, in addition to the external and internal variables mentioned previously, school culture also plays an important role in successful technology integration (Tezci , 2011).

In order to explore teacher perceptions of school culture related to the level of ICT usage, Tezci (2011) examined Turkish teacher perceptions from both the technical and motivational perspectives. The results showed that their perceptions from both perspectives were not positive, because the majority did not believe that they would receive adequate technical and motivational support from their school. However, as the school culture became more positive, the teachers' ICT usage level increased. Ward and Parr (2010) stated that teachers need to feel confident in their ability to facilitate student learning with technology in order to integrate technology into their classrooms. To achieve this goal, more professional development is required with a focus on increasing teachers' skills so that they are able to overcome apprehensions associated with using technology. Further, new teaching approaches and technical support should be offered by schools to allow them to retain control while facilitating learning with computers. Overall, implementing effective teaching with technology integration requires changes in teachers' knowledge, beliefs, and school culture (Ertmer & OttenbreitLeftwich 2010).

Another integral facet of ICT integration in schools is the availability of proper infrastructure, i.e. installation and maintenance of electricity and telephone communication facilities, acquisition and maintenance of computers, and Internet connectivity. Human resources also play an important role since teachers and other educational personnel need to use ICT effectively and impart knowledge and skills to pupils. Implementation plans need to evaluate current needs and future goals and ensure that adequate training and support are provided. The ICT-in-Education Toolkit (<http://www.ictinedtoolkit.org/usere/login.php>) is an online tool that can help policymakers to plan during various phases of ICT in education initiatives (Haddad et al., 2007).

3.0 FINDINGS AND DISCUSSIONS

3.1 Schools Readiness in Computer Adoption

This section seeks to address the following question items: Do you have a computer centre for your school?, Do you have a computer lab?, Do you have a computer technician?, Do you have a printer?, Do you have an overhead projector?, Do you have internet connectivity? as well as Is your school connected to the national grid?. From the study findings the responses with highest number of the respondents included presence of a printer 28(96.55%) and school connectivity to the national grid 22(75.86%).

This was followed closely by presence of a computer centre school 17(58.62%) and presence of a computer lab 17(58.62%), as shown in table 4.15 and apparently one of the key findings from the study after getting responses from head teachers was the fact that there was serious lack of internet connectivity, with only 6(20.69%) of them agreeing that there was internet connectivity.

Table 1: School readiness in computer adoption

Response	Frequency	Percentage
Presence of a computer centre school	17	58.62 %
Presence of a computer lab	17	58.62 %
Presence of a computer technician	13	44.83 %
Presence of a printer	28	96.55 %
Presence of an overhead projector	16	55.17 %
Presence of internet connectivity	6	20.69 %
School connectivity to the national grid	22	75.86 %

3.2 Number of computers in school

With respect to the following question item; (How many computers do you have in your school?), the table below represent the findings.

Table 2: Number of computers in school

No. of computers	Frequency	Percentage
1	2	6.90 %
2	1	3.45 %
3	3	10.34 %
4	1	3.45 %
6	2	6.90 %
8	1	3.45 %
10	3	10.34 %
11	1	3.45 %
12	3	10.34 %
15	2	6.90 %
20	1	3.45 %
24	1	3.45 %
30	4	13.79 %
40	2	6.90 %
50	2	6.90 %
Total	29	100.00 %

The study findings reveals that top three schools that had the highest the number computers was 50, 40 and 30 with their respective the number of the respondents as 2(6.9%), 2(6.9%) and 4(13.79%) making a total of 8(27.59%) of the respondents on the other hand the top 5 number of computers with majority of the respondents were 30(Frequency=4, Percentage=13.79%), 12(Frequency=3, Percentage=10.34%), 10(Frequency=3, Percentage=10.34%), 3(Frequency=3, Percentage=10.34%) and 50(Frequency=2, Percentage=6.9%) making a total of 15(51.72%) and furthermore from the study findings the mean, mode and median number computers were 16.8276, 30 and 12 respectively.

3.3 How computers were acquired

As shown in table 3 shows that the number of the respondents the sources of acquisition of computers in school included Donation(Frequency=11, Percentage=37.93%), Purchased by school(Frequency=9, Percentage=31.03%), G.O.K(Frequency=8, Percentage=27.59%), Not sure,(Frequency=1, Percentage=3.45%), clearly showing that the largest sources of computers were donations and purchases making a total of 20(68.97%) and from the study findings the Government of Kenya seems to make only a small percentage of less than 30% of computers to secondary schools.

Table 3: How computers were acquired

Sources	Frequency	Percentage
Donation	11	37.93 %
Gok	8	27.59 %
Not sure	1	3.45 %
Purchased by school	9	31.03 %
Total	29	100.00 %

3.4 Readiness in computer adoption

With schools readiness in computer adoption as one of the objectives table 4. addresses the following question items; Connectivity to power either by Electricity or Solar?, Do you have a computer lab or room in your school?, Do you have a computer technician in your school?, Do you have internet connectivity in your school? and If you don't have any computers are there plans for acquiring any?, were discussed all of these with the following descending order of responses in agreement with the questions posed i.e. if you don't have any computers are there plans for acquiring any? 381(99.22%), connectivity to power either by electricity or solar? 350(91.15%), do you have a computer lab or room in your school? 279(72.66%), do you have a

computer technician in your school? 181(47.14%) and do you have internet connectivity in your school? 92(23.96%).

Table 4: Readiness in computer adoption

Response	Frequency	Percentage
Connectivity to power either by Electricity or Solar?	350	91.15 %
Do you have a computer lab or room in your school?	279	72.66 %
Do you have a computer technician in your school?	181	47.14 %
Do you have internet connectivity in your school?	92	23.96 %
If you don't have any computers are there plans for acquiring any?	381	99.22 %

4.0 Conclusions and Recommendations

Overall school readiness to embrace CAI is crucial in the implementation. The study findings as shown in Tab 1, Tab 2 and Tab 3, show the presence of gadgets like printers, Overhead projectors connectivity to national power grid. Most of the computers were purchased through donation and while others were purchased by the school.

The school board and senior management as well as the government need to allocate enough funding for the purpose of making sure that the school is equipped with all the tools and infrastructure geared towards ensuring readiness to embrace CAI.

School readiness to adopt the mode of learning that will involve computer is crucial. In this regard for instance ensuring the presence of such things such as, a good computer lab or computer room, purchasing of gadgets such as ,overhead projectors, printers and computers. School connectivity to the national grid is also important to ensure supply of power and more so backup for power such as solar panels is also recommended. Internet connectivity seems to be a

challenge as the study results indicate thus the school top management need to ensure internet is well catered for.

REFERENCES

- Almusalam, S. N.(2001). Factors related to the use of Computer Technologies for Professional tasks by Business and administration teachers at Saudi technical colleges.(Doctoral Dissertation, the Ohio State University, 2001) ProQuest Digital Dissertations (UMI No. AAT3011019).
- Andoh, B. (2012). An Exploration of Teacher Skills, Perceptions and Practices of ICT in Teaching & learning in the Ghanaian second- cycle schools, *Contemporary education technology* 3(1) 36-49.
- Becta. (2004). A review of the research literature on barriers to uptake of ICT by teachers. Retrieved June 10, 2010, from <http://partners.becta.org.uk/pagedocuments/research/barriers.pdf>.
- Bordbar,.(2010). English teachers'attitudes towards the computer-assisted language learning. *International Journal of Language Studies*,vol.4,no.3,pp.27-54.
- Bowes, J. (2003). *The Emerging Issues Repertoire demanded of teachers of the future: Surviving the transition*. Retrieved July 17, 2011, from, <http://crpit.com/confpapers/CRPITV23>
- Cope,C.,&Ward,P.(2002).Intergrating learning technology into classrooms:The importance of teacher'perceptions.*Educational Technology &Society*,5(1),67-74.
- Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of use and User Acceptance of Information Technology. *MIS Quarterly*, 13, 319-339.
- Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, Minneapolis, 13(3), 319-339.

- Drent, M, & Meelissen, M. (2008). Which factors obstruct or stimulate teacher educators to use ICT innovatively? *Computers & Education* 51(1) 187-199 <http://dx.doi.org/10.1016/j.compedu.2007.05.001>.
- Ford, D. M. (2007). *Technologizing Africa. On the Bumpy Information Highway*. London: Oxford University press.
- Gross, R. (1995). Defining the new mandate for distance learning in the 21st century. *Community College Journal of*, 66, 28-33.
- Harrison, A. W. & Rainer, R. K.(1992). The Influence of Individual Differences on skill in End-User Computing. *Journal of Management Information System*, 9 (1),93-111.
- Higgins, S, & Moseley, D. (2011). Teachers thinking about ICT and Learning: believes and outcomes. *Journal of teacher development*, 5(2) 191-210 <http://dx.doi.org/10.1080/13664530100200138>.
- Honey, M. Culp, K, M, & Carrigg, F. (2000). Perspective on Education & Technology Research Lessons from the Past and Present. *Journal of Educational Computing Research*, 23(1). 5-14.
- Huang,H.M.,& Liaw.S.S.(2005).Exploring users'attitudes and intentions toward the web as a survey tool.*Computers in Human Behavior*,vol.21,no.5,pp.729-743.
- Huang, H & Liaw, S. (2008). Exploring users' attitudes and intentions towards the web as a survey tool. *Computers in Human Behavior* 21(5) 729-743 <http://dx.doi.org/10.1016/j.chb.2004.02.020>.
- Keengwe, J., & Onchwari, G. (2008). Computer Technology integration & student learning: Barriers and Promise. *Journal of science and technology*, 17(2011) 560-565. Unpublished M.ED.Thesis, Kenyatta University.

- Keengwe and Onchwari (2011) Computer Technology Integration and Student Learning. *Journal of Science and Technology Education*, 17(2011) 560-570..
- Korte, W. B,&Husing, T, (2007). Benchmarking access and use of ICT in European Schools.2006: Results from Headteacher and a classroom survey in 27 European Countries, *cleaning papers*, vol.29, no, 10, pp,1-6.
- Mumtaz, S, (2000).Factoers Affecting Teachers use of Information and Communication Technology : Areview of the Literature. *Journal of Information Technology foe Teacher Education*, 9 (3). 319-342.
- Perraton, H, Robinson, B, & Creed, C (2001).*Teacher Education through Distance Learning; technology, curriculum, evaluation, cost*. Paris: UNESCO.
- Simonson, M. (2008).Technology use of Hispanic Bilingual Teachers: A function of their Believes, the classroom, *Journal of Instructional Technology* 31(3) 257-266.
- Tedre, M., Chachage, B., & Faida, J. (2009).*Integrating Environmental Issues in IT Education in Tanzania*. Frontiers in Education Conference, San Antonio, U.S.A.
- Teo, T, (2008). Pre-service Teachers attitude towards Computer use:A Singapore survey, *Australasian Journal of Educational Technology*, vol. 24, no. 4, pp. 413-424.
- Teo, T. (2012).Pre Service Teachers Attitudes towards computer use: Singapore Survey. *Australian Journal of Educational Technology*, 24 (4), 413-424.
- Tondeur, J, Valcke, M, & Van Braak, J.(2008) . A multidimensional approach to determinants of computer use in primary education: Teacher and School Characteristics. *Journal o Computer Assisted Learning*, vol .24, pp. 494=506.
- Watson, G, (2006). Technology Professional Development:Long term effect on teacher self efficacy. *Journal of technology and teacher education*. Vol, 14, no,1, pp. 151-166.

West, P. (1995).Clinton pushes school - technology campaign. *Education Week*, 18-23.

West, P. (1996).Many governors touting technology as a magic bullet. *Education Week*, 22-23.

Woodrow, J. (2002).The use Influence of programming training on the computer literacy and attitudes of pre-service teachers. *Journal of Research on Computing in Education*, 25(2)200-219.