

***Barriers to the Use of ICT in Education: Case Study of
Mogadishu Secondary Schools, Somalia***

Mr. Mohamed Hussein Hassan

Dean and Lecturer, of faculty of Computer Science and Information
Technology, Mogadishu University

Abstract

The purpose of this research is to explore the barriers encountered when introducing ICT in education in Mogadishu Secondary schools. The research assessed the influence of National/school education ICT policy and strategy; infrastructure availability, use and ease of access; and future support that teachers find useful. The paper has also reviewed a number of studies from different parts of the world and paid greater attention to those barriers existing within some of the developing countries.

The study adopted a survey research design. The sampling unit was 7 randomly selected schools from Mogadishu Secondary Schools. From each school fifteen teachers were selected for the questionnaire using random sampling technique. This made a total of 105 subjects as a whole. The data collection instruments used was an adopted questionnaires used by Department of Education and Training of Western Australia (WA).

Data generated was analyzed and presented in tables and/or figures. The findings of the study have shown lack of government ICT policy and strategy and the response of many teachers also indicated that the educational system currently having resource level problems such as lack of adequate computers and other ICTs tools, poor internet connectivity, etc.

This study concludes that the introduction of ICTs in education in Mogadishu schools is between emerging and applying stages and it is important to take measures to overcome the identified barriers in order to pass to the next stages and towards reaching the top most. Finally the paper suggested recommendations to the concerned stakeholders.

Keywords: ICT, Barriers, infrastructure, availability, Mogadishu, Somalia

Introduction

Information technology (IT) is the application of computers and telecommunications equipment to store, retrieve, transmit, and manipulate data (Daintith, 2009). A research made by Tedla (2012, p.199) concluded that ICT is crucial for anytime and anyplace learning to ensure economic growth. There is substantial evidence that Information and Communication Technology promote quality education and effective teaching- learning atmosphere for both student and teacher.

Over the past decade in various parts of the world, information and communications technology (ICT) has become an important aspect of education at all levels from primary schools to universities. Many secondary and even elementary schools today have a computer (or ICT) teacher, and in increasing number of elementary schools (UNESCO, 2005, p. 190). Review of a research made by Tedla (2012, p.200) revealed that the countries in the study (East Africa) have played a critical role to incorporate and progress ICT into schools as part of their curricula with the exception of Somalia.

For any nation to boast of educational development, it should be able to boast of a viable and functional information and communication technology driven education in secondary schools (Osakwe, 2012, p.188). Therefore this paper examined the barriers to the use of ICTs in education in Mogadishu secondary schools and answered questions of:

- How does the Somali ICT policy framework support ICTs integration in secondary Schools in Somalia?
- To what extent are the necessary infrastructures for ICT (computers, internet) available in secondary schools?
- What types of support teachers' would find useful to assist them to further develop their ICT knowledge and skills and apply them in the classroom.

This paper provides background information to the use of computers in Mogadishu Secondary schools, with a discussion of the findings of current international research on the barriers of ICT use in education, and compares them to those existing in Mogadishu Secondary schools. It provides suggestions and recommendations to the organizational and political leadership about ways to introduce information and communication technologies (ICT) into education.

Literature Review

The paper has reviewed a number of studies related to the use of ICT in education from different parts of the world and paid greater attention to those barriers existing within some of the developing countries to compare them with those existing in Somalia.

2.1 ICT in Schools

Secondary schools with good ICT resources that use them well achieve better results than those schools with similar resources that are used less effectively (Becta, 2003, p.16). Therefore the use of ICT in education particularly in Secondary Schools is very important for providing opportunities for both the teachers as well as students as it improves the teaching and learning process. Studying the factors affecting use of ICT in education may help policy makers and administrators in education to improve quality of teaching and learning. Bowes (2011, p. 2) argued that when using ICT in the classroom, teachers need to explicitly plan with student learning outcomes in mind.

Somalia gained its independence in 1960 following the merger of the British Protectorate and the Italian Trusteeship Territory of Somaliland, and thirty years later the country was plagued by a civil war. This war had ceased, but the education system had disintegrated beyond repair (Hare, 2007, p. 2).

of Mogadishu Secondary Schools, Somalia

During the period of the former government (1960-1991) most schools in Somalia were publicly owned and funded. Education was free, compulsory and accessible to all especially in urban areas. For instance, in Mogadishu, the capital of the country alone, there were 92 Schools, 54 primary schools, 25 Secondary Schools, 4 vocational and technical institutes and 9 kindergarten schools all run by the central government through the Ministry of Education (MoE, 2011, p. 7).

2.2 Benefits to the Use of ICT in Schools

There are a lot of benefits to the use of ICT in schools. Tedla (2012, p. 204-205) deduced in his study on six (6) East African countries, that the benefits of ICT include:

- ✓ Generating of information and ideas;
- ✓ Fast information processing, analyzing and problem solving;
- ✓ High student management;
- ✓ Increased teacher and student motivation;
- ✓ Enhanced subject matter mastery by teachers.

Other benefits include:

- ✓ High student interaction with the content;
- ✓ Enhanced confidence and high self-esteem;
- ✓ Self-directed and independent learning;
- ✓ High quality output;
- ✓ Reduced teaching load;
- ✓ Accommodation of new technologies with the existing ICT materials;
- ✓ Integration of content into projects;
- ✓ Easy teacher, student and content evaluation;
- ✓ Easier communication across units and better; and
- ✓ Collaboration among stakeholders.

Likewise Osakwe (2012, p.389) mentioned in his paper, on Nigerian public secondary schools, the role of ICT in secondary schools as the following:

- Information and communication technology helps to promote fundamental changes in teaching and learning methods; thereby helping to overcome the barriers of time and place as technology introduces new choices and opportunities for students and teachers through endless research and learning on the internet.
- ICT provides secondary school students with practical and functional knowledge of the computer, the internet and other associated gadgets that will have positive effect on future experience and make them more competent, rational and comfortable in this era of globalization.
- ICT helps students to react intelligently to future changes, expand information and live successfully in a changing world.
- ICT, through its multimedia facet, creates room for students to acquire new knowledge, fosters enquiry and exploration of facets, and adopt new approaches to teaching and learning.
- This conventional system helps to accelerate the learning process, increase teachers efficiency and effectiveness and provides remedial instruction and enrichment of material, thus guaranteeing higher quality standards in secondary schools.
- ICT facilitates students' acquisition of skills and potentials for active participation in the teaching/learning process and it also helps to enrich the curriculum by replacing the existing face-to-face instruction.
- ICT as a tool for learning enables secondary school students to efficiently and effectively access digital information for the purpose of investigating issues and solving problems.

There is a clear and positive relationship between good ICT learning opportunities and higher pupil achievement in secondary education (Becta 2003, p.8)

Khan, Hasan & Clementm (2012, p. 61) mention that although ICT has the potential to improve the educational system to a great extent, developing countries are far from reaping these benefits because of certain barriers. It was stated by research made by UNESCO Institute for Information Technologies in Education (2004, p.11) that though Secondary Education traditionally orients toward strict curricular content specifications and national final examinations, there is an ongoing trend to invest in students' capacity to learn independently and authentically. This trend needs ICTs as infrastructure and cognitive support tools.

So, as Somalia is one of the developing countries, it is important to evaluate the existence of factors hindering the introduction of ICT into its education, especially in the secondary schools.

2.3 Factors Affecting Integration of ICT in Education in Schools

We have seen the role and importance of ICT in education but there are many obstacles that prevent or reduce the perfect utilization of information and communication technologies as they are supposed to be. These barriers affect the use of ICT on different levels of the different countries due to existence of the causing factors.

Tedla, 2012, p. 199, found that the inhibiting factors include unrealistic policies of ICT, poor infrastructure, lack of teacher competence, confidence, incentive, perception and beliefs, imposed curriculum, lack of proper network, political instability, brain drain, and sporadic electricity. He also found that poor transportation, lack of public awareness and participation, poor school leadership, technological illiteracy and lack of pedagogical skills also contribute to the inhibiting factors.

Aduwa-Ogiegbaen and Iyamu (2005 p. 108) reveal mostly the same in their study. They stated that there are several impediments to the successful use of information and communication technology in secondary schools in Nigeria. These are: cost, weak infrastructure, lack of skills, lack of relevant software and limited access to the Internet. Osakwa (2012) found similar challenges facing ICT development in Nigerian secondary schools, including inadequate funding, lack of qualified personnel, lack of basic infrastructural resources, and poor policy formulation and implementation.

Pupil achievement is higher where ICT learning opportunities are good or better, supported by good ICT resources. Of course, the presence of ICT resources in a school does not automatically have an impact on achievement. The key factor is whether ICT is used effectively in teaching and learning, and in particular whether pupils have good quality opportunities to learn with ICT (Becta, 2003, p.21)

In addition, obstacles such as access to equipment, time pressures, lack of mentors, and opportunities for apprenticeship of observation also have an impact on teachers' ability to use ICT (Slaouti & Barton, 2007 in Lau & Sim, 2008, p. 20). While there are several studies about how ICT is being used in developed countries, there is not much information on how ICT is being integrated into schools in developing countries.

2.4 Stages of ICT Usages

Researchers around the world identify stages in the way that teachers and students learn about and gain confidence in the use of ICT; Majumdar (2009, p. 9) mentioned a model based on UNESCO publication has been developed and expanded which conceives of four stages viz., Emerging, Applying, Infusing and Transforming. Emerging stages mean that teachers are beginning to become aware of the potential of ICT. Applying stages imply to that teachers may be learning how to

use ICT for teaching & learning. Infusing stages mean that a variety of ICT tools are being used and integrated into the curriculum. Transforming stages involve new ways of approaching teaching and learning situation with specialized ICT tools to be used to explore a variety of real-world problems through innovative learning. The New Partnership for Africa's Development (NEPAD) has scored the level of African continent students' experience with ICTs and their proficiency in using them very low (Adomi, Esharenana, Kpangban& Emperor, 2010, p.2).

2.5 ICT in Somalia

Countries in the various region of the world are at different stages of ICT development in terms of both infrastructure and application of ICT in teaching and learning. Within any such country, there may be uneven development from region to region, area to area, and even from institution to institution (Majumdar, 2009, p. 1). So it is important to know the status and stage of Somali ICT development since it is recovering from decades of conflict and militancy to be able to take advantage and benefit from the use of ICT in education.

In Somalia, there is a seemingly healthy ICT infrastructure, however, this is mostly found in the urban centers and especially the capital city, Mogadishu. This, therefore, translates to limited use of ICT in the school system in Somalia most of which are located out of Mogadishu. Policy efforts in education have been focused on reviving the education system, increasing enrolments, and reducing the school dropout rate and not ICT. There are some private schools that use ICT but more as an administrative tool than being integrated into the teaching and learning (Hare, 2007, p. 5).

The majority of Somalis is familiar with mobile phone technology and is open to accessing other types of technology. As yet, child friendly technology has not been introduced into schools in Somalia. The MoE is

willing to lead this process and will benefit from exploring the range of educational technologies that will be best suited to the contextual challenges they face before making informed and appropriate cost effective choices (UNICEF, 2013).

In Mogadishu most of the Secondary schools are not-equipped with ICT infrastructure, so the research focused to assess the influence of the independent variables of National education ICT policy and strategy, infrastructure availability, use and ease of access, and future support that teachers find useful.

The study was conducted within the capital city of Somalia, Mogadishu, as it provides an optimal focus for this study because it is where most of the secondary schools are developed in Somalia.

Research Methodology

The aim of this research is to understand and find out the challenges that face the use of ICTs in Mogadishu Secondary schools. The study adopted a survey research design. The sampling unit was 7 randomly selected schools. From each school fifteen teachers were selected to be distributed the questionnaire using random sampling technique. This made a sample size of 105 subjects as a whole.

Data analysis employed descriptive statistical techniques by carrying out some type of grouping of data collected, there after placing data in common categories and computing percentage of each group after which the results were presented in tables and figures supported by some discussions.

The survey was designed to measure the factors affecting ICT integration in education particularly the barriers to the use of ICT in education. More particularly, the survey collects information on the views on a range of matters relating to ICT skill and usage, including:

- Their school's ICT capacity regarding performance of specific aspects;
- ICT policy/guideline at national and school levels.
- Future support that teachers find useful

Analysis and Interpretation of Data

4.1 Profile of Respondents

- The profile information of respondents included gender, age and experience in teaching of 105 respondents, 82 (78.1%) were males and 23 (21.9%) were females
- For the age groups, majority of teachers 36 (34.3%) were between 30-39 years old and the second rank belongs to age group between 25-29 years old.
- Regarding teacher levels, nearly quarter of the respondents 56 (53.3%) are senior teacher level 2. When it comes to teaching experience, nearly quarter of the respondents, 25(23.8%), had 2-3 years of teaching experience.

4.2 ICT capacity - performance of Specific Aspects

Because of the strong relationship between a schools' ICT capacity and the ICT skills and knowledge of its teachers, it is important to understand what comprises ICT capacity and how it can be improved (Dept. of Education WA, 2004).

The survey asked teachers to rate the availability, use and ease of access of 14 different ICT resources at their school, those being: Internet, Printer, Desktop/laptop computer for personal use, Notebooks for teachers program, SIS curriculum manager, Personal email account, School intranet, Digital cameras, Specialist software applications (e.g. CAD, HTML editors etc.), Technical support, Digital projectors/interactive whiteboards, Desktop computers for student use in

your classroom, Desktop computers for student use elsewhere at school (e.g. computer lab); and Laptop computers for student use.

Table 1: Depicts the Levels of Availability, Use and Ease of Access with Each of the ICT Resources for all Teachers.

Base: All Respondents	Available, Used with ease of Access	Available, used with No ease of Access	Available, Not used	Not Available
Printer;	70(66.7%)	34(32.4%)	1 (1.0%)	0(0%)
Desktop/laptop computer for personal use;	35(33.3%)	11(10.5%)	35(33.3%)	24(22.9%)
Notebooks for teachers program;	20(19.0%)	10(9.5%)	14(13.3%)	61(58.1%)
Internet;	16(15.2%)	8 (7.6%)	19(18.1%)	62(59.0%)
Personal email account;	15(14.3%)	4(3.8%)	7 (6.7%)	79(75.2%)
Digital projectors/interactive whiteboards;	10 (9.5%)	8 (7.6%)	8 (7.6%)	79(75.2%)
Specialist software applications (e.g. CAD, HTML editors etc.)	10 (9.5%)	6 (5.7%)	6 (5.7%)	83(79.0%)
Digital cameras;	9 (8.6%)	6 (5.7%)	4 (3.8%)	86(81.9%)
Desktop computers for student use elsewhere at school (e.g. computer lab);	8 (7.6%)	7 (6.7%)	0 (0%)	90(85.7%)
Technical support;	6(5.7%)	4 (3.8%)	11(10.5%)	84(80.0%)
SIS curriculum manager;	0 (0%)	0 (0%)	0 (0%)	105(100%)
School intranet;	0 (0%)	0 (0%)	0 (0%)	105(100%)
Desktop computers for student use in your classroom;	0 (0%)	0 (0%)	0 (0%)	105(100%)
Laptop computers for student use.	0 (0%)	0 (0%)	0 (0%)	105(100%)

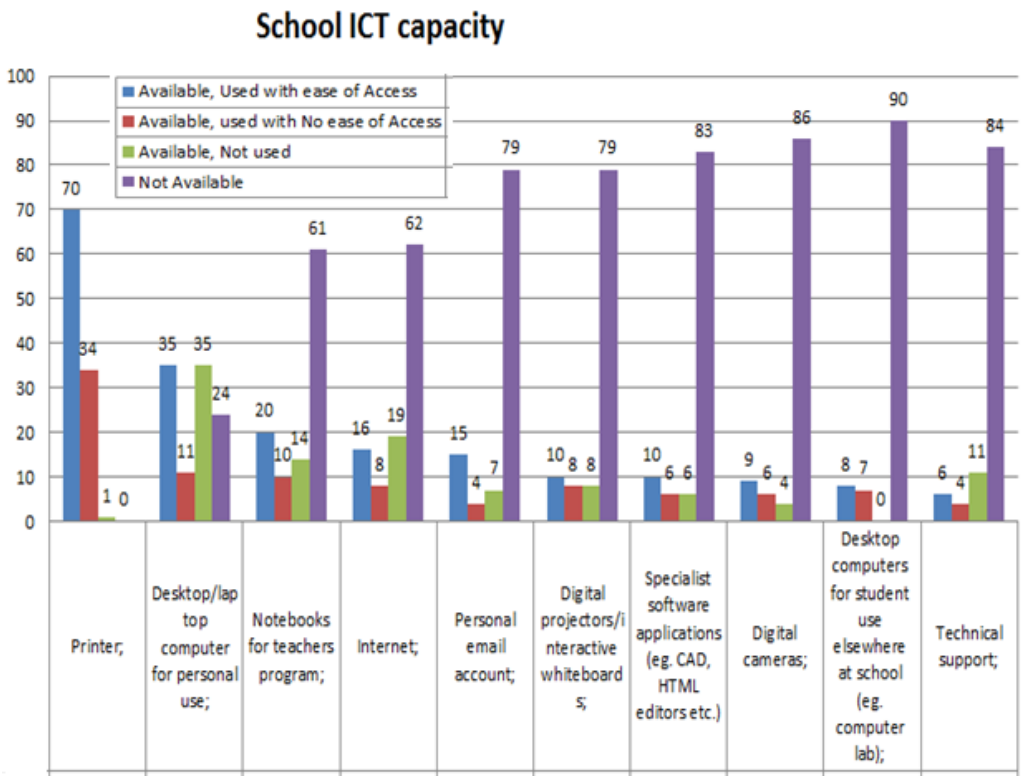


Figure 1: School ICT Capacity

The results found in summary showed that:

All of the target secondary schools are totally not having the following resources of SIS curriculum manager; school intranet; and Desktop computer for student use in classroom; and Laptop computers for student use. More than 60% of respondents said that their school does not have all the listed resources except printer and Desktop/laptop computer for personal use. Printer is the only resource that is available in all schools, used with ease of access of about 67% of teachers while the remaining showed not having ease access. Desktop/laptop computer for personal use for teachers, 33% of respondents replied that the resource is available, used with ease of access while equal number agreed with them

regarding the availability but reported that they have not used. Regarding Desktop computers for student use elsewhere at school (e.g. computer lab) is not available in most of the schools. Personal email accounts and internet are not widely available to teachers; they are only 15%, and 16% respectively.

4.3 ICT Policy

Teachers were asked in the survey the existence of National ICT education policy/guideline by answering yes or no; and when did their school start ICT education?

The questions asked where:

- Does your national government specify an ICT education policy/guideline?
- Does your government guarantee standardized ICT education nationwide?
- Does your SCHOOL specify an ICT education policy/guideline?
- Does the government grant an extra budget for the ICT education at your school?
- When did your school start ICT education? (Select grade level)

There answers are shown in table 2

						Yes	N0
Does your national government specify an ICT education policy/guideline?						0	105
Does your government guarantee standardized ICT education nationwide?						0	105
Does your SCHOOL specify an ICT education policy/guideline?						75	30
Does the government grant an extra budget for the ICT education at your school?						0	105
When did your school start ICT education? (Select grade level)							
	G9	G10	11	G12	N/A		
	0	45	0	30	30		

The results found in summary showed that:

- ✓ There is no national government ICT education policy that guarantees standardized ICT education nationwide.
- ✓ Currently there is no budget from the government for support to the ICT education at schools, but 75 (71%) respondents reported that their school specifies an ICT education policy/guideline.
- ✓ Regarding in which grade schools start ICT education, 45(42%) mentioned that they start at grade 10 while 30 (29%) start at grade 12; the remaining 30(29) not yet started ICT education.

4.4 Future Support that Teachers Find Useful

This section discusses the types of support teachers told us they would find useful to assist them to further develop their ICT knowledge and skills and apply them in the classroom. This was an open ended question and the responses made a total of 9 different items. Items of similar type were summed up from those who responded to the question and a summary of their responses is shown in Table 3

Future support that teachers find useful	n=105	Percent
Need for sufficient computers and computer labs	47	45%
Relevant professional development about using ICT in classroom	41	39%
ICT technical support to help teachers	37	35%
Reliable internet access	31	30%
Laptop for teachers	19	18%
School ICT budget support	15	14%
Digital projectors	13	12%
Sufficient digital resources	8	8%
Sufficient suitable software	7	7%
No comments	53	50%

The results in summary showed that the statements "Need for sufficient computers and computer labs" and "Relevant professional development about using ICT in classroom" are mentioned by nearly all of those who made comments about this section, their others interests can be seen from the above table.

Conclusion and Recommendations

5.1 Conclusion

In general most of the respondents have basic idea about the concept of ICTs integration in education and its role for the introduction of modern communication tools. The results found are similar to those found by Malcolm, E. and Godwyll, 2009, p. 21, about the problems of lack of adequate computers and other ICTs tools especially in rural schools, poor internet connectivity, lack of adequate manpower and lack of coherent ICT policy framework in Selected Ghanaian Schools.

Therefore, the use of ICT in education in Mogadishu secondary school systems in Somalia is an important step in promoting innovation and rebuilding of the country.

However, the educational system currently having problems such as lack of adequate computers and other ICTs tools, lack of national as well as school level ICT policy framework, poor internet connectivity. In conclusion, the introduction of ICTs in education in Mogadishu schools is important and beneficial for the future life of students in participating schools as well as at higher education but currently it is between the emerging and applying stages which are the lowest levels of the four stages identified by the researchers in the way that teachers and students learn about and gain confidence in the use of ICT.

5.2 Recommendations

The set of policy, social, economic, technical and environmental challenges that confront ICTs integration in schools are significant and require an education system that can develop means to overcome barriers identified in the research.

The government should provide policy direction to address issues such as provision of computer laboratories, staffing the laboratories with permanent technology coordinators etc. and look at the broad range of educational policies, programs and structures that must also be changed to schools have to address the challenges confronting ICTs integration in schools.

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