

PRACTICES OF ADOPTING E-SKILLS FOR TEACHING AND LEARNING IN UGANDAN SCHOOLS

Bada Joseph Kizito, Jarkko Suhonen
Faculty of Science
Department of Computer Science and Statistics
P.O. Box 111, FI-80101
Joensuu, Finland

ABSTRACT

The purpose of this paper is to review the process of ICT adoption in Ugandan schools for facilitation of teaching and learning in the last decade. This review is done in order to examine how beneficial e-skills have enhanced teaching and learning in Ugandan schools, and to identify the outstanding challenges the schools have had in e-skills adoption. When ICT started gaining popularity in Uganda in mid 90s, the schools were the first beneficiaries chosen by international development partners as a starting point for spreading ICT skills to the communities of Uganda. Different approaches have been used by different international bodies in implementation of ICT education projects in Ugandan schools. Some of these projects involved the community from the surrounding of the schools in getting e-skills from schools (such as World Links for Development and NEPAD) while others focused on training needs of students and teachers only. We have used SWOT analysis to examine e-skills adoption practices in Ugandan schools. Using this approach of analysis, we have identified benefits schools obtained from e-skills, the weaknesses in e-skills adoption process. We also present the factors that are important for ICT education and the opportunities for future e-skills adoption.

KEYWORDS

E-skills, ICT projects in Uganda, e-Schools, ICT Education, telecollaboration, SWOT analysis

1. INTRODUCTION

In this paper we analyze how ICT education and e-skills have been evolving in Ugandan schools. According to the United nations 2006 report, 14% of the world's populations were Internet users by the end of 2004; over half of the population in the developed countries had access to the Internet compared to 7% in the developing countries and less than 1% in the least developed countries of Sub-Saharan Africa (UNDESA, 2006). Uganda's vision for education in regard to accessing new technologies shares much with developed regions of the world. The Ugandan ministry of education and sports seeks a number of ways to incorporate new technologies in education system of Uganda (Mutonyi and Norton, 2007). The key players of school-based ICT implementation projects in Uganda were World links for development (World Links, 2008), Uganda Connect (Uconnect) and NEPAD (New Partnership for Africa's Development). The above projects brought innovations to teaching and learning processes in Ugandan schools in the last decade. In this paper, we analyze the modes of implementation of these projects at schools in terms of set objectives or policies. The paper presents ICT implementation results in the schools. Chapter 2 includes a summary of ICT projects that have been going on in Ugandan schools together with their activities. In chapter 3, we analyze the results and impacts of projects using SWOT analysis based on the findings from chapter 2. Finally we summarize and conclude the findings of this exercise in chapter 4.

2. ICT EDUCATION AND e-SKILLS PROJECTS IN UGANDA

This chapter presents the organizations that played leading roles in promoting computer literacy or ICT education in Uganda in the last decade. The organizations are namely, World Links for Development

(WorLD) known as SchoolNet, Uganda connect (Uconnect), NEPAD, Uganda Communications commission and Uganda Digital Education Resource Bank (UDERB).

2.1 Schoolnet Uganda

SchoolNet Uganda was started in 1997 as a program jointly supported by World Links for Development (WorLD) currently (World Links Organization), World Bank Institute and Ministry of Education and Sports of Uganda. The purpose of establishing SchoolNet was to support the introduction of information and communication technology (ICT) in Schools and build the pedagogical capacity to optimally use the ICT resources in the schools. SchoolNet also aimed at using Internet to enhance the teaching and learning process as a means of increasing access, quality and relevancy of education (SchoolNet, 2008).

Some of the services that schoolNet offered to schools included: provision of affordable computers, ICT for educational advice and sensitization, teacher pedagogical professional development and support, school networking and school international linkages for project-based learning. World Links for development used wireless connectivity (VSATs) to link Ugandan schools in rural areas to their partners in other parts of the world. After five years experience of wireless connectivity, it was found to be effective for rural communication when correctly applied (SchoolNet, 2008).

A SchoolNet Uganda was incorporated as an NGO in December 2003 with aim of transforming Ugandan educational system from an Industrial model (learning by assimilation) to a knowledge-based model in order to prepare the youth of Uganda for global economy based on knowledge, information and technology (John, 2005). According to ITU (2003), Uganda emerged in Africa as a test-bed for new technology implementations specifically in the education sector. According to ITU and Eremu (2005), the two donor funded projects in Uganda namely World Links for development and Uganda Connect achieved the following developments in promoting e-skills acquisition:

- Provision of computers and Internet connection to 70 schools throughout the country
- Giving opportunities to community members (health workers, business men, civil servants, pastors, etc) around the schools to access school-based telecenters after the school hours.
- Creation of awareness of ICT in education through press articles, education ICT demos and conferences, seminars and exhibitions.
- ICT education promotion through ICT holiday camps, website development competitions, and generation of local content.
- Introduction of VSAT (Earth – satellite) for connecting rural schools in Uganda. This initiative was the first ever to be implemented in Africa.

2.2 Uganda Connect (Uconnect)

According to Eremu (2005), the Uconnect project was created to promote ICT education in schools and was later incorporated as a non-governmental organization (NGO) in 1996 with the objective of promoting ICT education to the public by providing necessary hardware, software and training services. Uconnect delivers educational resources to schools through a programme adopted from Advanced Interactive (AI) Inc., a Canadian ICT firm. AI provides technology-based teaching and learning to teachers and students based on Canadian education system. Uconnect used HF-based E-mail for communication. The HF radio connection addressed the problem of digital divide between the urban and the rural population in Uganda and this helped to introduce ICTs in areas deprived of basic infrastructure (ITU, 2003).

2.3 The Nepad E-Schools Initiative

The New Partnership for Africa's Development (NEPAD) is a vision and strategic framework for Africa's renewal. The NEPAD strategic document arose from a mandate that was given to the five initiating heads of State (Algeria, Egypt, Nigeria, Senegal and South Africa) by the Organization of African Unity (OAU) to develop an integrated socio-economic development framework for Africa. NEPAD was conceived to renew Africa in an era of escalating poverty levels, underdevelopment and continued marginalization (NEPAD, 2005).

As one of its developmental agenda, NEPAD identified ICT infrastructure development as a priority for promoting sustainable development in the African continent.

The NEPAD e-Schools initiative is a multi-country, multi-stakeholder, continental initiative, for imparting ICT skills to young Africans in primary and secondary schools. The aim has been also to use ICT to improve the provision of education in schools. NEPAD’s aim is to impart e-skills to majority of Africans by implementing e-schools initiatives in more than half a million schools in Africa in a period of ten years (NEPAD, 2005).

Uganda was selected as one of the countries for demonstrating NEPAD e-schools initiative in Algeria, Burkina Faso, Cameroon, Egypt, Gabon, Ghana, Kenya, Lesotho, Mali, Mozambique, Nigeria, Rwanda, Senegal, South Africa, and Mauritius.

In January 2005, the NEPAD e-schools coordinators set the following objectives for NEPAD e-schools:

- To provide ICT skills and knowledge to primary and secondary school students that will enable them to function in the emerging information society and knowledge economy.
- To make every learner health literate.
- To provide teachers with ICT skills to enable them to use ICT as tools to enhance teaching and learning.
- To provide school managers with ICT skills so as to facilitate efficient management and administration in the schools.

The objectives were realized with the following implementation process. First, an appropriate infrastructure in form of buildings, electricity, security, information technology equipment, and connectivity was constructed. Secondly, content was mainly developed in the fields of education and health. Thirdly, people were trained to master basic ICT skills and teachers’ competencies were developed. Finally, a proposition of legislations and regulations were created on the use of ICT (NEPAD, 2007).

The African e-schools are expected to achieve the aforementioned objectives. Table 1 presents the main outcomes from the demo e-schools in Africa.

Table 1. NEPAD e-School Outcomes and Impact Indicators

NEPAD e-Schools Outcomes	Impact Indicators
<p>1. Students Through the use of ICT:</p> <ul style="list-style-type: none"> • develop an appropriate level of ICT capability • become more engaged in own learning 	<p>Demonstrate proficiency in the use of ICT for:</p> <ul style="list-style-type: none"> • Word processing, Spreadsheets, Basic e-mailing, Basic Internet browsing, Presentation tools, graphics • Use of ICT to collaborate, publish and interact with peers, experts and other resource people. • Use of ICT to locate, evaluate and collect information.
<p>2. Learning environments ICT is used to support constructivist teaching that is more:</p> <ul style="list-style-type: none"> • Learner-centered • Knowledge-centered • Assessment-centered • Community-centered 	<ul style="list-style-type: none"> • Students use ICT to investigate the real world and build a wider, deeper knowledge base. • ICT enables students to be active as participants in their own learning. • The interactive, multimedia and communication characteristics of ICT are used to enhance student motivation • ICT is used to foster collaboration and cooperation among students and more interaction with teachers • ICT is used to support more individualized learning (at the student’s own pace)
<p>3. Teacher ICT Competencies Teachers are competent to apply ICT in order to:</p> <ul style="list-style-type: none"> • Support students with respect to learning activities • Create a constructivist learning environment • Contribute to the relevant learning communities. 	<p>Teachers are:</p> <ul style="list-style-type: none"> • able to teach students how to use available hardware devices safely. • able to use and apply basic software programs in the context of their teaching • able to use ICT to improve their professional and administrative proficiency • able to use the Internet to locate additional learning resources to enrich the curriculum

	<ul style="list-style-type: none"> • able to use ICT to facilitate a variety of assessment and evaluation strategies • aware of health, legal and ethical issues with regard to the use of ICT • able to plan and design learning experiences supported by ICT with a special reference to health topics •
<p>4. School ICT capacity All teachers and students have immediate access to:</p> <ul style="list-style-type: none"> • The hardware and software necessary to support the curriculum • The support necessary to enable its use. 	<ul style="list-style-type: none"> • Teachers and students have ready legal access to a range of appropriate content software. • Students and teachers have ready access to appropriate hardware. • Effective policies are in place for the management of hardware resources. • Teachers and students have access to online hard services such as Internet and e-mail. • Teachers and students have access to technical support when required. • There is management and coordination of digital resource materials across all learning areas.
<p>5. School environment The school environment is supportive of the teachers and students' use of ICT based on a shared, community-based vision that prepares students to learn, work and live successfully in a knowledge-based global society.</p>	<ul style="list-style-type: none"> • National policies and long-term plans are in place to promote and support and use ICT in schools. • Pedagogical school policies encourage students to reach out beyond the classroom. • curriculum support personnel are available to assist teachers to integrate ICT in the learning and teaching process •
<p>6. Health Point The health point is a unit to be developed within each school through which to:</p> <ul style="list-style-type: none"> • Provide access to information more especially in rural areas. • Health promotion to children, parents and community. • Health workers' access to information • Health services to students 	<ul style="list-style-type: none"> • Health education is promoted in schools via print and ICT related methods including broadcasting • A health portal is available to health workers and the wider community • Mass media are used to promote healthy living and to provide health related information on topics such as HIV/AIDS and Malaria, TB, nutrition, and hygiene.

Source: NEPAD (2005)

Itai (2007) acknowledged that Bagulumbya e-school in Uganda provided students possibilities to use online resources, such as protection against HIV/AIDS in society. The initiative also supported the training of teachers in e-skills for instructional content development. The e-school also contributed to the training of community members surrounding the school in ICT skills and helped establishing digital resources centers for sharing and distributing educational content.

2.4 Uganda Communications Commission (UCC)

According to Muwanga (2007), the following are the key targets of connectivity to be achieved by the Ugandan telecommunications sector by the year 2010.

- Uganda's communication commission (UCC) will spend USD\$ 1 million to connect 80 secondary schools to the Internet in 2008

- Institutional data access points of not less than 256 kilobytes per second (kbps) will be setup for Universal Primary Education (UPE) schools, post primary institutions, government health units and local council (LC3), and population centers exceeding 1,2000 people.
- There will be establishment of public voice access points within each parish at Local Council two (LC2) with high capacity backbone linking all district headquarters and major towns.

2.5 The Uganda Digital Education Resource Bank (UDERB)

The Uganda Digital Education Resource Bank (www.uderb.org) is an online repository of learning objects relevant to the Ugandan educational system produced or identified by Ugandan teachers and students. The learning objects on the Uganda Education Resource Bank include but are not limited to lesson plans, past exam papers, simulations, animations, learning activities, website links, photographs, study guides, audio and video clips etc. Major activities under this project include: ICT education to teachers with emphasis on multimedia content development; creation of the Uganda Digital Educational Resource Bank to provide teachers with access to relevant teaching curriculum and to provide an opportunity for teachers and schools to share educational resources; creation of an online community of practice through social networking; Promotion of Uganda Digital Educational Resource Bank at national and international conferences and exhibitions; and documentation of the process, performance and outcome experiences of the project to be shared for possible replication.

3. SWOT ANALYSIS OF ICT EDUCATION AND e-SKILLS PROJECTS IN UGANDA

In chapter 2 we presented several initiatives to foster the development of e-skills for teaching and learning in Ugandan schools. In this chapter, we will use the SWOT analysis method to identify main achievements and areas for improvement. Table 3 includes the results of the analysis.

Table 2. SWOT analysis of ICT education and e-skills projects in Uganda

Strengths	Weaknesses
<ul style="list-style-type: none"> • Commitment from school management, staff and students in ICT education for e-skills acquisition • Stable Internet connectivity • Political goodwill and support for ICT projects • All projects have known goals and objectives • Skills in office automation and email use are acquired by teachers and students. • Development of global teenage projects (telecollaboration projects). • The goodwill, interest and personal commitment of the head of school. 	<ul style="list-style-type: none"> • No technical support for troubleshooting computer hardware equipment • ICT Projects are donor initiatives and sustainability is difficult because the schools do not have funds. • Schools are not keen in resource sharing because of traditional attitudes of competition in academic excellence. • Project evaluation is not regularly done by the founding bodies (donors). • lack of national ICT policy for directing ICT activities • ICT is not examined as a subject in primary and secondary schools • Lack of content creation for local needs of Ugandans, hence limited online educational resources relevant to the needs of Ugandans • Lack of e-skills to search appropriate content for classroom use with limited time as Internet is expensive to use. • Unreliable electricity/power supply.

	<ul style="list-style-type: none"> • Limited number of computers connected to the Internet. • High student-computer ratio. • Lack of resources to motivate teachers who teach computer courses at the computer centre as extra load. • Lack of technical skills for building professional software applications for e-learning and e-library for schools to use.
<p>Opportunities</p> <ul style="list-style-type: none"> • Introduction of mobile learning and remote teaching at schools • Provision of Internet links to classrooms for lessons especially for e-commerce • Growing demands of e-Skills in the country • Continued support and goodwill from Uganda government with creation of ICT ministry in 2006 to promote ICT use for national development. • Increasing outreach plans with emphasis on rural schools. 	<p>Threats</p> <ul style="list-style-type: none"> • Internet content is not filtered exposing students to inappropriate areas such as pornographic sites that lure them to immorality • Failure to respond adequately to the educational needs of the local people when developing ICT-based content for teaching and learning.

4. CONCLUSION

The international bodies namely World Links for development, Uganda Connect and NEPAD have promoted ICT education and e-skills acquisition in Ugandan schools by introducing computer centers for telecollaboration projects, training in basic ICT skills, facilitation of teaching and learning process by setting up local areas networks for educational content access. The schools have also served the surrounding population in areas that include training in basic ICT skills and provision of e-mail and Internet services for communication.

ICT can add value to the existing education system when it is used constructively to support teaching and learning. ICT can greatly increase teacher productivity by increasing availability of educational resources (Internet), improving content delivery process (using slides and LAN), motivating students by use of multimedia, promoting team work among teachers and students by networking, providing additional support to slow learners by using animations as teaching aid, and simplifying teaching and learning process by removing geographical boundaries and time limits. The literature has shown good progress of ICT adoption in Ugandan schools, however, it should be noted that the schools that have benefited from various donor-funded ICT projects are still very few and due to limitation of resources that include electricity, computer hardware equipment, software, Internet connectivity infrastructure, and trained manpower, most of the schools are still lacking facilities to embrace ICT education and e-skills. Wireless technology has potential for connecting rural schools to Internet. There is still problem with information sharing at schools which should be addressed with continued ICT awareness creation. A comprehensive ICT policy creation is critical for directing all ICT initiatives in the country.

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