Space, Technology and Content: A Model For Public Libraries Supporting Formal Education in Developing Countries.

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Abstract

Kenya’s remarkable progress in developing an Information and Communication Technology (ICT) policy framework and implementation strategy is well known. However, implementing the ICT in education strategy, including roll out of ICT to schools and training teachers, is hindered by lack of resources, poor telecommunications infrastructure, and inadequate electrical supply. Public libraries in Kenya have long supported the formal education system, providing free access to educational resources, quiet space for learners to study and do homework, and the support of skilled librarians. The knls Kibera Library e-learning project for school children in Kibera, a giant slum on the outskirts of Nairobi, takes this support to a new level. The knls Kibera Library e-learning project aims to attract children to the library; to train them in ICT skills, and to provide them with desperately needed educational resources. To achieve these goals, the e-learning project combines three essential features: attractive space where students can learn, play and interact with each other; modern ICT – low-power tablet computers with information storage, online communications and camera applications, and a high-speed wireless internet connection, and educational content based on the school curriculum. Knls collaborated with eLimu, an e-learning social enterprise that develops digitized curriculum content for Kenyan upper primary students in diverse and fun formats. To encourage learning, the library organized fun events, like reading fun days, competitions and quizzes. Librarians reported high levels of enthusiasm from the participants.

The paper discusses the experience and impact of the knls Kibera Library e-learning project. It argues that this library project’s unique combination of attractive space, appropriate technology and interactive educational content offers a cost-effective, efficient and replicable model for supporting formal education in developing country contexts, where ICT access remains a challenge and where schools are critically under-resourced.

Keywords: ICT, education, content, slum, space, knowledge, technology.

Introduction

While Information Communication Technology (ICT) continues to advance in western countries, African countries still experience a lag in its implementation, and Kenya is no exception. The millennium development goals (MDGs) and Education for All (EFA) initiatives targeted 2015 to achieve universal primary access and many countries are far from reaching this goal (Mukudi, 2004; UNDP, 2008; UNESCO 2008a). In recent years, the issue of the digital divide has drawn intense attention from most developed and developing countries. “Digital divide” generally refers to unequal access to ICT and the gap between those who are “information-haves” and those who are “information have-nots”. In addition to inequalities in accessing ICT, lack of computer knowledge and skills also contribute to the digital divide. This knowledge and skills gap results from limited economic and organizational resources in developing countries, which constrains their ability to build and expand their education systems.

In Kenya the Ministry of Education, Science and Technology (MoEST) is responsible for providing education to its citizens. At this stage, technology education and inclusion of ICT in education is still in its infancy. To integrate ICT appropriately in order to increase the quality of education, technology and teaching methods go hand in hand. The Ministry’s tasks include employment and training of teachers, curriculum development, distribution of learning resources and implementation of education policies. Education in Kenya is directly influenced by government policies and is therefore constantly changing according to socio economic and political trends. In the colonial period, prior to independence, primary school education was the responsibility of local communities, non-governmental agencies and church organizations. After independence in 1963, the government took responsibility for education. Administration of education gradually and shifted to government agencies in a move towards free primary education.

Formal education in urban informal settings is in crisis. Compared to formal urban settlements, schooling in informal ‘slum’ areas is poorly organized and less equitable. Worse still, according to a survey conducted by Allavida Kenya (2012) even the children who do make it to school learn little.

Basic and secondary curricula offer various technology and computer studies options. However, ICT provision to schools and teaching of these subjects has been slow. The reasons for this are several: lack of resources, poor telecommunications infrastructure, and inadequate electrical supply especially in the slums and rural areas. Many schools do not have electricity or are struggling with frequent power blackouts. Some head-teachers obstruct introducing computers to schools, fearing maintenance and other costs. There is also technophobia among head teachers and teachers because they lack skills.

knls is working hard to support national ICT strategy, which aims to put Kenya on the road to becoming a knowledge economy, by providing access to digital technology and e-literacy training. Public libraries that are part of the knls network provide equality of access to a range of resources, including, increasingly, ICT, that meet the needs of communities, for education, information, leisure and personal development. In this
context, knls Kibera library developed its ICT in education programme, to expand access to both technology and educational materials for slum school children, and to help bring education of children in slum schools to the level that is experienced in more formal urban settings.

Kibera library is is located right inside the slum, close to the people. Kibera is one of the largest slums in Africa bordering Nairobi city. Most houses are made of wooden shacks with a mud floor and a tin roof - no toilets or running water. Kibera's water is piped in by private dealers, mostly operating illegally, laying hosepipes in the mud, and charging exorbitant rates for the water. The available facilities such as schools, hospitals and clinics were started by NGO’s. Schools in the slum are also made of mud/dirt floors, grey mud walls and furnished with old-school wooden pews. The classes are very small but crowded, with as many children as 60 children per class. Learning materials like books, pens and computers are lacking. The inhabitants of Kibera live on less than a dollar a day. Often they do not have enough money to pay school fees, or to buy food and medicine.

In this situation, Kibera children struggle to pass national exams. Lack of access to ICT disadvantages these children and youth in the job markets that increasingly demand ICT skills. School children and youth lack space at home to study, do homework, and play during their leisure time.

**Benefits of ICT to Children**

*Quality and accessibility of education*

Extending ICT facilities in the library such as e-readers and tablet computers it opened up a new world for children and youth, giving them a chance to travel across the globe, learn about different cultures, languages and gain exposure to ideas they may have never encountered in their own local community. It is also entertaining and educational to the children and youth. ICT increase the flexibility of delivery of education such that learners are able to access knowledge anytime and when they are in the library. It also influences the way children and youth are taught and how they learn since the process is learner driven and not teachers driven. This in turn prepares them for lifelong learning as well as improves the quality of learning. One of the most vital contributions of ICT in the field of education is- Easy Access to Learning. With the help of ICT, children and youth are able to browse e-books, sample examination papers, previous year papers etc.

*Enhance learning Environment*

With the use of ICTs and audio-visual resources such as video games in the tablet computers, children and youth gain educational knowledge by listening. Also through playing games children learn without realizing because they compete in mathematical work outs, word searches etc. which help them to sustain interest in reading. The various humorous stories in video format and eLimu application help them to develop the sense of humour and enable them build up the right attitude towards reading.
ICT presents an entirely new learning environment for children and youth, thus requiring a different skill set to be successful. ICT has changed the process of reading and learning in the library through adding elements of vitality to learning environments. It is a potentially powerful tool for offering educational opportunities and it is difficult or maybe even impossible to imagine future learning environments that are not supported, in one way or another, by Information and Communication Technologies (ICT). It also provides opportunities to access an abundance of information using multiple information resources and viewing information from multiple perspectives, thus fostering the authenticity of learning environments. Through evidence ICT make complex processes easier to understand through simulations that, contribute to authentic learning environments.

Motivates learning

ICT enhance the quality of education in several ways, by increasing learner motivation and engagement, facilitating the acquisition of basic skills, and enhancing teacher training. ICTs are transformational tools which, when used appropriately, can promote the shift to a learner centred environment. Tablet computers and Internet technologies; enable new ways of learning rather than the tradition way the children are allowed to explore other better ways. ICT has an impact not only on what children learn, but also plays a major role on how they learn. Along with a shift of curricula from “content-centred” to “competence-based”, the mode of curricula delivery has now shifted from “teacher centred” to forms of delivery of “student-centred”.

Videos, television and multimedia computer software combine text, sound, and colourful moving images to provide challenging and authentic content which engage the students in learning process. Interactive tablet computers make use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the children to listen and become more involved in the lessons being delivered.

Some of the teachers in Kibera opined that children were feeling more motivated especially when they visit the library during library lessons to learn using tablet computers and e-readers than the stereo type 45 minutes lecture. They were of the view that this type of learning process is much more effective than the monotonous monologue classroom situation where the teacher just lectures from a raised platform and the children just listen to the teacher. Educative videos are full of colourful illustrations which help them interpret visual representations. This helps the children especially the young ones to develop their sense of sight and ability to identify different colours and objects in the real life.

Assist in scholastic performance

Children with low concentration capability in reading are embracing technology. They exhibit abnormal reading patterns as they are normally restless, unable to sit at a place for more than few moments, inattentive and impulsive. This is because reading requires a sustained period of concentration. The use of computer tablets and audio-visual resources greatly help in capturing the attention of the children with these deficiencies and
consequently develop love for lifelong learning. ICT’s are said to help expand access to education, strengthen the relevance of education to the increasingly digital workplace, and raise educational quality. However, the experience of introducing different ICTs in the classroom and other educational settings all over the world over the past several decades suggests that the full realization of educational benefits.

**Communication**

Children gain ability to network, interact with other users and library staff. It’s important that librarians are able to keep up to speed with developments across their field. They are also familiar with standard library technologies, for example library specific software’s, as well as the range of technologies, platforms and approaches that support learners and enhance learners experience of reading, literacy, study and revision skills. The librarians are confident and are familiar users of technologies in order to be able to help learners overcome the range of different challenges they face.

**Knls Kibera Project Description**

The project was initiated in 2012 with financial support from the EIFL (Electronic Information for Libraries) Public Library Innovation Programme (EIFL-PLIP)². EIFL is an international not-for-profit organization dedicated to enabling access to knowledge through libraries in more than 60 developing and transition countries in Africa, Asia, Latin America and Europe. EIFL-PLIP) supports libraries to integrate ICT into public library community development projects.

In partnership with the educational agency, eLimu, and using a small grant from EIFL-PLIP, knls Kibera library designed a programme that made learning both affordable and fun. A wireless router and seven tablet computers were pre-loaded with educational applications, animations, games etc. An ICT training course was designed and children were taught how to use the tablet computers.

Initially, the training targeted children aged 12 to 14 years, but it became so popular that many other children joined.

The overall goals of the training were to:

- Develop students’ basic computer skills.
- Realize their talents in using ICT.
- Improve students' class performance through the interactive programmes using ICT

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² EIFL is EIFL is an international not-for-profit organisation dedicated to enabling access to knowledge through libraries in more than 60 developing and transition countries in Africa, Asia, Europe, and Latin America.

[www.eifl.net](http://www.eifl.net)
and engaging eLimu programmed content.

- Create awareness and attract children to learn more about ICT at Kibera community library through using the tablets.
- Connect slum children to the world.

A series of quizzes based on subjects like science, history, geography and mathematics were given to trainees and attractive prizes awarded to the winners. Word spread quickly and soon the library was inundated with eager children ready to learn.

With respect to content, the library worked closely with eLimu\(^3\) which has developed digitized curriculum content for Kenyan upper primary students in diverse and fun formats, including videos, animations, sound clips, music, quizzes, and stories games. In addition, eLimu has developed content aimed at promoting responsible citizenship (financial literacy, human rights, environmental conservation) and community health (sanitation, hygiene).

In less than a year, the library trained more than 120 students (aged 8-15) from 10 schools on how to use the tablet computers and to research in the internet. This was more than double the students who were intended to be trained originally. In 15 sessions children and youth were trained to access and use eLimu’s educational content. Sessions ended with quizzes testing the participants how far they had learnt and the key school subjects’ were considered to be on the front line i.e mathematics, science, English and others. Due to resistance of the head teachers to allow children to attend the training the librarian had to change the tactics and training was organized for teachers to deepen understanding of the value of the pre-loaded tablet computers and the internet to classroom learning.

To encourage more learning, the library organized fun events, like reading fun days, children reading tents and storytelling days and librarians reported high levels of enthusiasm. After a few month’s interactivity with the content, over half of the children surveyed by the library reported that the project had helped them improve in difficult school subjects, like mathematics, science and English. Teachers confirmed that children’s performance had improved as well as their social skills and confidence. The trainings are continuous in the library especially when the children visit the library. A ‘tablet hour’ was organized by the library whereby they collaborate with schools. The first Game Show was fun and engaging, especially when the children were competing to perform various tasks they had learnt. The tasks included:

- Solving math puzzles in record time
- Solving crossword puzzles in record time
- Searching for synonyms using the dictionary application

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\(^3\) eLimu is a non-governmental organization promoting ICT in education, based in Nairobi. See http://www.elimu.org/
• Finding information through Google
• Locating countries and their capital cities using Google maps.

Results and impact

The programme demonstrated the effectiveness of information and communication technology (ICT) in supporting classroom teaching, helping children and youth with vital school subjects resources.

Through collaboration of knls Kibera and eLimu the Kenya Education Bill Article 27 which recognizes the right of every child to basic education is supported. The overconfident commitments, however well stated may not make much difference to urban slum children and youth unless a sharp focus on learning outcomes is developed and evidence based programmes implemented. Knls Kibera stepped in to bridge the gap through providing also reading space, competitions during activities like children reading tents, storytelling days and playing during leisure time e.g. through the games applications in the computer tablets.

In Kibera the environment for reading is very poor. This means that knls Kibera has the responsibility of creating an enabling environment for reading. Children are encouraged to go to the library during their free time since there is good reading environment, technology and space for reading and playing. Conducive environment in the library encourages children and youth to engage in meaningful reading, learning and research activities. Kibera library being a multi-function it provides space for reading, information materials, e-readers and computer tablets. Through the use of technology children and youth develop positive attitude towards reading. Therefore the library provides an enabling reading atmosphere and technology for children and youth hence help to develop a reading culture.

Adults, youth and school going children looking for information will always find a quiet space within the building. One of the major milestones for the facility has been the creation of a thirst - especially in the younger population - for education. The content, technology and space offered at the library have encouraged children who had either dropped out or not gone to school previously, to ask their parents to enrol them in school. Hassan Omooria a pupil from Hope Academy said he enjoys the tablets and e-readers at the library most and as a KCPE candidate in one year’s time, his biggest worry was not having the right tools to study for the exams, but since the library was equipped with computer tablets he feels confident that he can give the final examinations his best, without worrying about shortage of information or a place to study. Other children who make use of the library resources especially the digital tools echoed Hassan’s remarks.

Asena a teacher at Ananjali primary school said that the level of improvement in the performance of the students in Kibera can only be attributed to the Kibera Community Library. He described the results of the previous year as a pleasantly shocking result. He
said the library opened up his mind and made it possible for him to enrol for a degree at a local university because he realized the library offers what he lacked most i.e. space, technology and content. He went further to say that he relies totally on the library for his studies.

**Impact of the Programme to the following groups:**

**Community**

- Demonstrate effectiveness of information and communication technology (ICT) in supporting classroom teaching.

- Help students with vital school subjects: over half of the students interviewed in a library survey said the library assist them to improve their English, mathematics and science because of providing computer tablets, e-readers, space and other information materials like curriculum books. This was confirmed by some teachers who said that since inception of the library in Kibera the students who visit the library more often had a trend of improvement.

- Provide space for studying for the entire community and especially children who come to do homework before going home after school.

- Won recognition: Kenya National Library Service secured funding from an international non-governmental organization to replicate the programme in three other branch libraries.

- Prepare children and youth for work in the job markets where ICT’s, particularly computers, internet and related technologies are becoming more and more ubiquitous. Technological literacy or the ability to use ICT’S effectively and efficiently, is thus seen as representing a competitive edge in an increasingly globalizing employment.

- Greater efficiency for children and youth throughout the school especially in using ICT for revision.

- Communication channels are increased through email, discussion groups etc. in the library.

- Library earns support from parents, teachers, and community at large in Kibera.

**Teachers**

- Able to assist librarians to train children when they visit the library.

- They learnt to share resources through the skills they gained during computer tablets training.

- Greater flexibility when carrying out different ICT tasks.

- Teachers gained ICT literacy skills, confidence and enthusiasm

- Able to use computer tablets and e-readers with confidence
• Enhancement of professional image projected to colleagues by the teachers who were trained.
• Able to access up to date information from the computer tablets and e-readers.

Children and Youth
• Benefited from the focused teaching which is tailored for them i.e elimu application.
• Gain understanding and analytical skills, including improvements in reading
• Comprehension i.e. understanding
• Development of writing skills including spelling, grammar punctuations, fluency, originality etc.
• Encouragement of independent and active learning and self-responsibility for learning
• Students found learning in a technology fun due to the enhanced setting of more stimulating and student-centred than in a traditional classroom.
• Age-gains in mental calculations and enhanced number skills for example the use of decimals.
• Better data handling skills and increased ability to read, interpret and sketch graphs in conceptual understanding of Mathematics (Particularly problem solving) and Science (Particularly through use of simulations).
• Facilitate children creativeness and innovativeness.

Conclusion
The project can be considered a success because the students continue to be equipped with knowledge and training on how to utilize the new ICT skills, and they learnt to work as a team by assisting each other. The children and the youth learned that the library is a store of knowledge, has ICT equipment i.e. computer tablets, e-readers, there is reading and playing space for them. As they visit the library on daily basis to do their homework they have learnt to live in harmony through interacting with each other and sharing computer tablets, assisting each other in the tablet club, networking and speaking publicly with confidence when expressing their opinions. The impact of the library to the youth and children in the slum is immeasurable, since it goes beyond learning especially when using tablet computers and e-readers. In interviews conducted, by the library to the children and youth expressed gratitude at the chance given to them to learn in the library, space provided, information resources, the computer tablets and e-readers plus the contents. As a result Kibera library is seen as a centre for expansion and growth within the slum settlement.
**Reference**


**Sub-theme: Education and training**