ABSTRACT

Computer and internet skills have become widely accepted as basic requirements for development. In recognition of this role the Government of Ghana has made the study of Information Communication Technology (ICT) part of the country’s educational curriculum beginning from the basic level. Government has also put measures in place to equip schools with computers to achieve this goal. However, it takes time and resources to equip all schools in the country with computers, internet connections and electricity, enabling students of practical lessons. Meanwhile public and community libraries can offer a feasible solution for schools to provide students with hands-on ICT experience necessary to succeed in examinations.

The goal of this paper is to present the experience of Volta Regional Library that is bringing learning opportunities to schoolchildren from underserved communities through mobile library ICT services. The library travels to schools in a van equipped with solar power, with fully-charged laptops to give children practical ICT lessons. This service was developed with support of the EIFL (Electronic Information for Libraries) Public Library Innovation Programme (EIFL-PLIP).

From October 2012, the library started weekly computer classes in five schools. Within six months it conducted 105 computer lessons, building the ICT competencies of over 200 students, increasing their potential to pass their exams. They used the educational content and games on the computers with ease and 119 of them could research on the internet and on the digital library (e-granary), and use e-mail. In April 2013, the library conducted a short impact survey with 60 participants. The participants believed the lessons had improved their chances of passing the Basic Education Certificate Examination. A paper on the success story of this first project was presented at IFLA WLIC 2014.

The library undertook advocacy and awareness-raising measures to attract support. The Ghana Investment Fund for Electronic Communication (GIFEC) increased support to the library with five additional desktop computers and a projector. With the help of EIFL-PLIP, the library raised additional funds through the international Global Giving fundraising website, to buy additional netbook computers. The success story attracted more schools. It was also used by EIFL to win funding from Nokia to replicate the service in three other regions in Ghana.

The paper draws conclusions based on the success of the service and recommends that government should expand and adequately resource public library service points in the country. Government should also assume responsibility for the running of community libraries established by the communities, through the Ghana Library Authority. It also recommends that all District Libraries be equipped with mobile library vans with solar power to enable them reach unserved and underserved communities with the innovative service.
1.1 Introduction

Education remains the fundamental tool for the rapid development of societies. Nations, therefore, endeavour to improve upon their educational systems to ensure they meet societal needs, and to achieve the best for their citizens in terms of social and economic development. However, in Ghana, efforts to enable the educational system to play its expected role in development are not realizing their full potential. In the view of the author, the weak library system in Ghana is a contributing factor to this failure. Most basic schools do not have libraries. Public libraries are not widespread, and are insufficiently resourced, in terms of staff, information resources, finance and equipment. Adequate and up-to-date print materials are hard to find in most public libraries in Ghana; electronic media are non-existent. Pupils and students struggle to find support for their learning, and so their education suffers. Poor and inadequate libraries also cannot contribute to literacy development in Ghana. According to UNICEF, literacy rates for youth between the ages of 15 and 24 for males is 88.3% and that of females is 83.2% giving an average of 85.75% (UNICEF, 2012). Despite this high rate of literacy illiteracy remains high in basic schools in rural areas and compounds the cycle of poverty in rural communities. One would expect the literacy rate in basic schools where the foundation is laid to match the statistics. In these communities students in the basic schools find it difficult to pass their Basic Education Certificate Examinations (BECE) and so cannot progress to senior school. Public Internet facilities that could help bridge the knowledge and information gap of students in rural communities are non-existent. The few that could be found are so costly that the ordinary student cannot afford to use them. Government efforts to bridge the digital gap through the provision of laptop computers to rural schoolchildren have not yielded much success.

Volta Regional Library, a regional wing of the Ghana Library Authority, sought to complement Government efforts to bridge the digital gap and support children’s education by bringing information and communication technology (ICT) to schools to enable children learn the subject hands-on. Through its “Mobile Library Internet Service for Development” project, the library visited selected rural communities in under-developed parts of Ho Municipality in a mobile van equipped with solar power, wi-fi Internet and computers pre-loaded with educational material related to school subjects, and an eGranary digital library. Working with teachers, librarians conducted ICT classes with students.

The project had four aims: (1) to support children’s learning of school subjects, including ICT, which is now an examinable subject in the school curriculum; (2) to help bridge the digital divide by providing access to computers and the Internet to rural communities; (3) to enable youths to play a role in community development, and (4) to demonstrate the role of public libraries in contributing to education and national development.

The Volta Regional Library “Mobile Library Internet Service for Development” project was a partnership with the international non-governmental organization, Electronic Information for

2 The eGranary Digital Library - also known as "The Internet in a Box" - provides millions of digital educational resources to institutions lacking adequate Internet access. See http://www.widernet.org/egranary/ (visited April 17, 2014)
 Libraries (EIFL), and was funded by a grant (approximately US$15,000) from EIFL’s Public Library Innovation Programme (PLIP)\(^3\). The grant enabled the library to install solar panels on the van, to acquire five laptops, five collapsible chairs, the eGranary digital library package, and to train librarians and teachers to manage and implement the project.

1.2 Education system development in Ghana

The educational system in Ghana has evolved through decades of reforms. It has evolved from the system inherited from the country’s colonial masters, the British Administration, in which it took six years to complete primary school, four years to complete middle school and seven years to complete secondary school (total of 17 years), to a system in which students take nine years to complete basic school (six for primary school and three for Junior High School), and three years to complete Senior High School (total of 12 years). The education system continues to undergo reforms to make education meaningful to Ghana’s progress. Now, in what is called the “Information Age”, strategic plans include ICT. The school curriculum includes ICT as a formal subject, with the aim of transforming Ghana’s economy to meet the needs of the citizens and reap the rewards of the digital era.


The purpose of the ESPs is to help reduce poverty through the development of a learning society, and enhancing Ghana’s human resource-base. They are designed to ensure that all learners gain the necessary knowledge, master the necessary skills and acquire the necessary attitudes for them to develop as individuals, to improve their social well-being and to improve Ghanaian society. This dream is, however, yet to be fully realised.

An objective of the policy goals of the ESPs stipulates that the Ministry of Education should provide school and public library facilities and encourage community/private libraries. All schools in Ghana were to be provided with adequately stocked libraries/resource rooms by 2015. Strategies earmarked towards achieving this include conducting needs and readiness assessment surveys, constructing and rehabilitating ten regional libraries, providing all schools with library/resource rooms, designing and publishing Information, Education, Communication(IEC) materials for libraries and developing programmes involving District Assemblies, communities and the Private Sector for the provision of libraries at the community level. The achievement of these provisions is farfetched. Though some communities took up the challenge of establishing their own libraries they lack adequate support from the local and

\(^3\)EIFL’s Public Library Innovation Programme (EIFL-PLIP) provides public library users and communities with new and innovative services by offering grant and capacity building support to public libraries. EIFL-PLIP also tests replicability of innovative services and fosters take-up of innovative services by more public libraries through wide dissemination of the results of services supported by EIFL-PLIP. [http://www.eifl.net/plip](http://www.eifl.net/plip) (visited April 17, 2014).
national governments to resource and manage the libraries, leading to the collapse of most of them. Government is, however, adding libraries to some 200 Community Senior High Schools being built to guarantee easy access to secondary education in communities selected for the project.

Another objective seeks to place ICT in schools and institutions of higher learning. Strategies to achieve this objective include writing a national policy on education, including syllabi; providing necessary infrastructure to support ICT Education programmes at senior secondary level; training a core team in ICT as Trainers of Trainers/Tutors (TOT); providing appropriate ICT training opportunities at all levels utilizing Science Resource Centres; developing a cadre of trained persons to support the delivery of ICT in schools and institutions (pre-service and in-service); providing access to the Internet and establishing a networking system as a basic part of the instructional environment in selected primary, secondary and tertiary institutions, and constructing/rehabilitating computer laboratories in schools and institutions (Ministry of Education, 2003).

1.3 ICT in education policy

Government was committed to a comprehensive programme of rapid deployment and utilization of ICT within the Education Sector to transform the education system and thereby improve the lives of the people. This was to ultimately transform the agro-based economy of Ghana into an information rich and knowledge-based economy and society using ICT. It is Government’s desire that through the deployment of ICT in education, the culture and practice of traditional memory-based learning would be transformed to education that stimulates thinking and creativity necessary to meet the challenges of the 21st Century, creating new possibilities for learners and teachers to engage in new ways of information acquisition and analysis.

In conformity with the educational reforms Government came up with “ICT in education” policies with key elements such as:

1. Equity - taking care to avoid cases where technology further amplifies existing divides and address issues of gender and special needs education.

2. Access to ICT Infrastructure – ensure affordable and continuous access to hardware, software and connectivity. This is dependent on the availability of appropriate physical infrastructure including classrooms and power sources (e.g. electricity or solar).

3. Capacity Building – ensure the user has the requisite level of skills, knowledge and attitudes for using the technology for the tasks required.

4. Norms & Standards – address issues of open source, copyright, licensing, refurbishment and inter-operability. Define nationally accepted norms and standards for use, content, connectivity, hardware, software, technical support and community engagement.
For the successful implementation of these policies Government identified responsible institutions, such as ministries, private organizations, development partners, NGOs, etc. (Ministry of Education and Sports, 2006).

1.4 Challenges in Implementing “ICT in Education”

Though Government’s commitment to improving education through ICT made progress on several fronts, some factors inhibit the achievement of the objectives. These include:

- Highly inadequate access to ICT and uneven distribution throughout Ghana, with an urban bias.
- Low capacity of teachers and educators to deliver policy with many averse to adopting ICTs in the classroom or with inadequate skills.
- Lack of adequate collaboration between the Ministry of Education and Ghana Education service or other implementation agencies such as ministries, departments, and agencies.
- Inadequate partnerships and collaboration between the ministry and the private sector.
- Lack of adequate buildings, poor infrastructure including insufficient classrooms to accommodate computer lab space, lack of electricity (especially in rural areas).

To help achieve the ICT in Education targets, Government adopted the One Laptop per Child (OLPC) initiative, which sought to expand the use of computer technology, especially among school children in under-developed parts of the world. The main tool used is an Internet-connected laptop (Buchele (nd)).

Ghana signed an agreement with OLPC to purchase 10,000 XOs (laptops), scheduled for delivery in 2009. The Education Ministry was tasked to oversee the implementation of this programme in collaborating with Ministry of Communication. The memorandum of understanding stipulated that every school going child must be given a laptop which will be owned by the child. As at August 2009, the Ministry had distributed about 1,000 laptops to 30 schools, each school having 30 laptops. Many schools in rural areas were selected to benefit from the one-laptop initiative, but most of them lack electricity. The programme was thus suspended to make room for the provision of electricity to these schools, after which procurement and distribution of the laptops will resume. The rest of the laptops were kept at the Ministry to be given to schools requiring replacements when laptops break down (Agbenyo, October 2010).

1.5 Intervention by the public library

In Ghana the role of public libraries in social and economic development as well as good governance has not been recognized by Government, hence Government’s inability to effectively implement the provisions made for them in the Education Strategic Plans. The libraries have also not been identified by policy-makers as spaces that could be used to reach a wider
population of students with ICT more conveniently than the individual schools. These spaces could also serve better in building the capacity of teachers in ICT than workshops that leave the teachers without any avenue to improve the skills imparted to them.

Ghana has ten regional libraries and 51 branch libraries. Several community libraries were also established with the support of benevolent individuals or groups. The country has 216 Metropolis, Municipalities and Districts which should all have libraries.

Out of the ten regional libraries only four have professional staff. Most of the branches are under the care of High School graduates who have gained some experience in library practice. The library school in Ghana turns out a number of graduates each year but they all seek employment in special and university libraries where the conditions of service are better.

Most of the community libraries have stopped functioning because external funding ceased and the Metropolitan, Municipal and District Assemblies (MMDAs) could not continue the provision of both human and material resources to sustain them. These libraries did not also have professional staff.

The public and community libraries by virtue of their position, therefore, could not engage in enough advocacies and also make themselves more visible through innovative activities to win the heart of the people and much bigger support from government, both local and national.

In 2008 the Ghana Library Authority reintroduced the traditional Mobile Library Service in all the ten regions of the country. This was made possible by the donation of 10 buses to the Authority by government for the purpose. Each of the ten regions was given a bus, refurbished to carry library books. The project began on pilot in two districts in each of the ten regions. Two communities were initially involved in each of the districts. Unfortunately there has not been a budget provision for the project, which nearly stalled it. In 2010 the Ghana Investment Fund for Electronic Communications (GIFEC), on the initiative of the Board chairman of the Ghana Library Authority, started collaborating with the Ghana Library Authority (GhLA) which oversees the public library service in Ghana to roll out its Library Connectivity Project. The GhLA-GIFEC collaboration aims to reach unserved and underserved communities, including school and street children, with ICT equipment and internet connectivity, using the existing Mobile Library Service van.

GIFEC, formerly Ghana Investment Fund for Telecommunications (GIFTEL), was born out of the Ghana ICT policy for Accelerated Development which came out of the Ghana Information Communication Technology for Accelerated Development (ICT4AD) policy, as an implementing agency of the Ministry of Communications in January 2004. Financial resources for the operations of GIFEC are provided mainly by the telecommunications service providers who, by law, are required to contribute one per cent of their profits annually towards the operations of GIFEC. Other sources include money given by parliament, monies accruing from investments made by Trustees of the Fund, donations, grants and gifts.

GIFEC is implementing 13 projects to meet its goal. The project involving the GhLA is the “Library Connectivity Project”, under which GIFEC intends to equip all public library service points and the Mobile Library Service with computers and Internet connectivity. The project
equipped all ten regional libraries with ten desktop computers, and connected them to the Internet; photocopiers to run the Regional Digital Library and Information Centres (RDLIC) and five desktop computers, six collapsible tables and chairs and a router were put on the Mobile Library Van to run the Mobile Digital-Cottages (MD-C). GIFEC was to supply the same facilities given to run the RDLIC to all 51 branch libraries by the year 2012. As at the end of 2013 only 30 had been connected, with a few challenges. The rest are been done in phases. GIFEC intended to add power generators to facilitate the use of the equipment in the rural areas but this idea is being given a second thought with the successful use of solar by the Mobile Library Internet Service for Development Project. GIFEC enhanced the capacity of staff on the Library Connectivity projects in ICT so they could effectively train people to become computer literates and be able to access the internet so they could be able to promote social and economic development of the people, through best practices. GIFEC occasionally supported the mobile library service with funds to enable it operate effectively. Without a dedicated budget this support alone could not help the service achieve much.

This context provides the backdrop for the Volta Regional Library’s Mobile Library Internet Service for Development Project which held ICT classes for selected deprived schools in the Ho Municipality.

1.6 Volta Regional Library and EIFL in partnership

The Volta Regional Library manages nine library service points in the Region, including the regional library which doubles as a municipal library for the Ho Municipality. This is done through the static libraries in eight districts. It ran the mobile library service in two districts on pilot but now concentrates the service in the Ho Municipality. The Ho Municipality where the service was relocated was one of the 25 Municipal and District Assemblies in the Volta Region. It covered a land area of 2660sq.km and had 772 communities with a total population of 271,881 (129,180 males; 142,701 females). It had a dependency ratio of 80% (68.0% children and12.0% old age). Over 65% of her population lived in rural areas; the balance of 35% lived in urban areas. The municipality had 81 pre-schools, 78 primary schools, 65 junior high schools, 12 senior high schools, two nursing training institutions, one polytechnic and two universities (Ho Municipal Assembly, 2012).

The Municipality has now been split into two, Ho Central and Ho West, for administrative convenience. The total population of Ho Central Municipality, where the mobile library service now operates stands at 177,281 comprising 83,819 males and 93,462 females. The urban population stands at 110,048 while the rural population is 67,233. These are located in 20 communities covering a land area of 2,361sq.km. Agriculture remains the mainstay of the municipality, employing about 70% of the economically active labour force (Ho Municipal Assembly, 2015). Despite the split the number of schools that the library dealt with is located in Ho Central and remains the target beneficiary of the project.
A cycle of poverty exists in most rural communities. This is compounded by the lack of school and public libraries and modern ICT infrastructure. This prevents children and adults from improving their education. ICT is a compulsory subject in the school curriculum, examinable at the final Basic Education Certificate Examination (BECE). However, most schools do not have computer laboratories and their communities also do not have Internet cafes. Where cafes are located in closer communities, the poor student cannot afford the cost of accessing information. Students are, therefore, unable to practise what they learn, and fail their ICT exams. The cost of failure for children of poor families is high – their parents take them out of school. Without skills, they are unable to compete in the job-market, and face an uncertain future.

To help curb the situation, the Volta Regional Library developed the “Mobile Library Internet Service for Development”, and in 2012 successfully applied for a grant (US$15,000) from EIFL (Electronic Information for Libraries) Public Library Innovation Programme (EIFL-PLIP).

The grant supported the purchase and installation of a solar panel unit on the mobile library van to charge the laptop computers, purchase of five robust netbook computers, computer management software and educational software related to the school curriculum. A digital library (eGranary) was also installed to offer children access to additional resources to build literacy capacity and to increase opportunities for research. The library also purchased collapsible chairs, a public address system to address children (some classes were over 90 children when combined) and a digital camera to record progress of the project. The grant also paid for internet connectivity for the project period.

Mobile library staff and two teachers from each of five beneficiary schools were trained in a two-day capacity building workshop to use the educational software and the eGranary. The ICT agency TechAide was contracted to provide technical support and training. Two mobile library staff also underwent additional ICT and pedagogical skills training. A series of meetings were held with school children, teachers, parents and community members including chiefs and queenmothers prior to launching the project on the 13th of October 2012. These meetings continued throughout the project period (one year), to create awareness about the project and its benefits.
1.7 Implementation

The official project period was from April 2012 to March 2013. The service was rendered initially to five schools in under-developed parts of the Municipality: Ziavi Dzogbe, Ziavi Lume, Klefe Achatime, Deme Fiave and Taviefe. Some of the schools did not have electricity; none had computer laboratories.

In less than a year (for about 31 weeks) the Volta Regional Library mobile library van travelled to the five schools, visiting each school once a week. The library paid 115 visits. The service conducted 105 computer lessons, building the ICT competencies of over 215 students between the ages of 11 and 16 and increasing their potential to pass their exams. The children learnt to use the educational content and games on the computers with ease. The library also taught 119 of the students how to conduct Internet search and to use the eGranary. In areas that had poor internet connectivity the students were relocated and those that could not be relocated benefitted from the use of the eGranary which is internet fashioned. They also learnt how to use e-mail and have created accounts. Fifty-three (53) children learnt search techniques and could access information on good agricultural practices.

In April 2013, the library conducted a short impact survey with 60 participants of the computer classes. All said they believed the lessons had improved their chances of passing the Basic Education Certificate Examination. At the end of the school year students and teachers from one of the schools involved in the project appreciated the impact made on their examination results by the project.

The library took advocacy and awareness-raising measures aimed at policy-makers and other stakeholders to attract additional funding and technological support. To sustain and expand the service, Ghana Investment Fund for Electronic Communication (GIFEC) donated five additional desktop computers, bringing the number of computers (laptops plus desktops) to 15. In addition, with the help of EIFL-PLIP, the library embarked on an online funding campaign through the international Global Giving fundraising website. Seven thousand dollars had been raised, enough to purchase seven more netbook computers and a printer for the service.

The project period had been extended initially to November 2013 to enable the library exhaust funds that had not been utilised. With the coming in of the Global Giving funds the project run for another year, December 2013 to December 2014.

1.8 More support for Ghana through EIFL

In 2015 EIFL used the success story of the project to compete for and won funding from Nokia to replicate the hands-on ICT classes service to other regions in Ghana. This new phase of the project is targeting 1,800 Ghanaian school children from four regions, including the Volta Region. The other three regions include Ashanti, Western and Upper East.

The package under this phase has been enhanced. Each of the new regions had 15 new netbook computers installed with the latest Microsoft Office package, other applications such as Soft ICT and EPP ICT (these will enable students read e-textbooks on ICT), e-Test (will enable students undertake self assessment tests in all subjects learned in school) and access to a collection of over a hundred e-books. The access to e-books was made possible through collaboration with
Other equipment provided includes printer/scanner, a projector, a projector screen and a router. The Volta Region Library also received five additional netbook computers with the new applications, a router, a projector and projector screen. As part of the package a one week workshop was organized for two mobile library staff and ICT teachers from five selected schools from the four regions to ensure a successful implementation of the project. Prior to launching the “Hands-on Computer Classes for 1,800 Ghana Children” project librarians from the new regions visited the Volta Regional Library for practical learning from the pilot project experience. While here they also visited schools that are participating in the hands-on- computer classes to observe the classes in action.

1.9 Achievements

1. The innovative project that employed the library’s van for delivering technology classes to schools has made the Volta regional library more visible in the communities in Ho Municipality, resulting in invitations from some local radio stations to the library to talk about the project.

2. Use of the mobile library service by schoolchildren increased by 37.8% - from 553 to 762 during the pilot project period.

3. Schools from Ho Municipality and beyond continue to call for the service to be extended to them. As an answer to the demand, the library’s van service increased coverage from five to ten schools in the Municipality.

4. Basic Education Certificate Examination results have improved during the period in some of the served schools.

5. The Library gained experience and skills, and is now able to support replication of the innovative practice elsewhere.

6. The project’s outcomes and impact story was disseminated on local and international level. It has prompted requests from Kyrgyzstan and Liberia for briefings on what contributed to the project’s success.

7. The success story and impact data of the project grounded further fundraising efforts that led to an extension of the service to three additional libraries.

8. With the new “Hands-on Computer Classes for 1,800 Ghana Children” project the Municipal Director of Education has approved the request for schools benefiting from the project to raise funds to support the library in fuelling the mobile van.

9. An extended service includes a collection of e-books uploaded on the laptops for the students to improve their reading abilities. This is to address the effect of low literacy levels on students’ performance identified in the pilot project.

[4](http://www.worldreader.org/) (visited February 22, 2016)
10. GIFEC is considering the option of installing solar panels on the rest of the vans instead of acquiring power generators that use fuel. GIFEC is also considering providing laptop computers instead of desktop computers to public libraries in Ghana to use on the mobile van.

1.8 Challenges

1. The biggest challenge to the project was that the library did not have enough computers. Pupil to computer ratio was high, and not all children could gain access to the computers to practice effectively.

2. A second challenge, frustrating to the children, teachers and library staff, was unstable Internet connectivity in rural areas.

3. The school timetable was disrupted by industrial action by teachers demanding salary adjustments.

3. Another challenge was and still is the cost of maintaining the mobile van, and fuelling it to ensure regular school visits.

4. The high demand for the service by other schools. The library has only one van, and cannot meet the demand.

5. Low literacy levels of students on the programme. Students followed the lessons and performed well on the computers but did not express themselves adequately when it came to answering questions in writing.

1.9 Conclusion

Lessons learned and recommendations

Considering the challenges Government is facing in expanding the ICT infrastructure to schools, the public library seems a viable option for Government to achieve the goal of reaching schools and helping children pass their ICT examinations and eventually closing the digital gap.

To achieve this, Government will have to resource and expand the public library service. A key intervention would be increasing the number of mobile library vans in the regions and equipping them with solar power to serve schools where there is no electricity.

The investment required reaching 19,854 primary schools (over 4-million pupils) and 12,436 Junior High Schools (with about 1.5 million students) through the electrification and computer roll-out programme is huge. Strengthening mobile libraries so that they can deliver an interim programme would be both quicker and cheaper.

Using public libraries to offer a service like what has been rendered by the Volta Regional Library would be a cost-effective interim measure to help children while Government continues with its electrification programme, which could take many years.
Once all schools have electricity and ICT, libraries would continue to play a support role to the education system - by providing on-going public access to ICT to youth and adults outside the education system - and to community development and good governance.

This intervention would have immediate benefits for children, especially in rural and under-developed parts of the country. As the experience of EIFL funded project has shown, it would also for the longer term, reinforce the value of public libraries to communities, as vital community resources.

In addition to public libraries, school libraries need to be established in all basic schools, equipped with both print and electronic resources, to enable the students do more practice and even read novels online to achieve education for all.

Government should absorb libraries established by the communities themselves into the public library system which is run by the Ghana Library Authority. This, coupled with sufficient resourcing of the libraries, will help improve literacy levels, as well as performance during examinations.

Government should give a listening ear to the Ghana Library Association, the Ghana Library Authority and other advocates for the public library service to appreciate how libraries, especially the public library, can drive progress across the entire UN 2030 Agenda\(^5\) for Sustainable Development to transform our world.

References


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