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## **Innovative Mobile Library Brings Rural School Children ICT and New Educational Opportunities**

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### **Abstract**

*Computer and Internet skills are compulsory subjects for Junior High School students (ages 11-16) in Ghana. However, many schools do not have computers, Internet connections or electricity, and so the students are unable to practise. As a result, they fail their ICT examinations. 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.*

*The goal of this paper is to present the experience of Volta Regional library in bringing new educational opportunities to school children from rural and poor communities through mobile library ICT services. The library travels to five schools in a van equipped with solar power, bringing fully-charged laptops for the children to use during ICT classes. This service was developed with support of EIFL's Public Library Innovation Program (PLIP) and is one of 18 innovative services that have been supported by EIFL-PLIP since 2010 in Africa.*

*The paper draws conclusions built on the success of this service, and considers opportunities for development of a similar service for children and young adults in other communities of Ghana and internationally.*

**Keywords:** Public library, services, technology, Internet, education.

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## 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 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 (primary, ages 6 – 11) 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 current statistics, 28 – 30% of Ghanaians aged over 15 cannot read or write (UNICEF, 2012)<sup>1</sup>. Illiteracy is higher in rural areas and compounds the cycle of poverty in rural communities. In these communities especially, students 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. 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, is seeking to complement Government efforts to bridge the digital gap and support children's education by bringing information and communication technology (ICT) to schools. Through its "Mobile Library Internet Service for Development" project, the library visits 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<sup>2</sup>. Working with teachers, librarians conduct ICT classes with students.

The project has 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 national education and development goals.

The Volta Regional Library "Mobile Library Internet Service for Development" project is a partnership with the international non-governmental organization, [Electronic Information for Libraries \(EIFL\)](#), and is funded by a grant (approximately US\$15,000) from [EIFL's Public Library Innovation Programme](#)<sup>3</sup>. The grant enabled the library to install solar panels on the

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<sup>1</sup>[http://www.unicef.org/infobycountry/ghana\\_statistics.html](http://www.unicef.org/infobycountry/ghana_statistics.html) (visited April 14, 2014)

<sup>2</sup> 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)

<sup>3</sup> 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> (visited April 17, 2014).

van, to acquire five laptops, 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 and reap the rewards of the digital era.

Critical post-independence education reforms took place between 1974 and 2007. The reforms include the Dzobo Education Reforms of 1974, the Junior Secondary School Education (Evans-Anfom) Reforms of 1987 and the Junior High School and Senior High School Education (Anamuah-Mensah) Reforms of 2007 (Annum-Odum(n.d.)). The nation also came up with Education Strategic Plans (ESPs) notably that of 2003, which spans the period 2003-2015 and that of 2010 which spans the period 2010-2020. 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.

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.

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 21<sup>st</sup> 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 seeks 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 XO's (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 stipulates 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 has not been recognized by the Government, hence Government's inability to implement the provisions made for them in the Education Strategic Plans. The country has ten regional libraries and 51 branch libraries. It has 216 Metropolis, Municipalities and Districts which should all have libraries. Several community libraries were established with the support of benevolent individuals or groups, but most have stopped functioning because external funding ceased and the Metropolitan Municipal and District Assemblies (MMDAs) cannot sustain them. Public libraries have 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.

In 2010 the Ghana Investment Fund for Electronic Communications (GIFEC) started collaborating with the Ghana Library Authority (GhLA) which oversees the public library service in Ghana. The GhLA-GIFEC collaboration aims to reach unserved and underserved communities, including school children, with ICT by using the existing Mobile Library Service.

GIFEC, formerly Ghana Investment Fund for Telecommunications (GIFTEL), was born out of the Ghana ICT policy for Accelerated Development (ICT4AD) 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.

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 has so far 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) in two pilot districts in each region. 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 26 have been connected, with a few challenges.

This context provides the backdrop to Volta Regional Library's mobile computer classes in Ho Municipality.

### **1.6 Volta Regional Library: the partnership with EIFL**

The Volta Regional Library both manages eight local libraries, and serves as the public library for Ho Municipality. This is done through the static libraries in nine districts and the mobile library service in some communities in three districts, including the Ho Municipality. Ho Municipality covers a land area of 2660sq.km and has 772 communities with a total population of 271,881 (129,180 males; 142,701 females). It has a dependency ratio of 80% (68.0% children and 12.0% old age). Over 65% of Ho's population live in rural areas; the balance of 35% lives in urban areas. The municipality has 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).

Agriculture is the mainstay of the municipality, employing about 70% of the economically active labour force. A cycle of poverty exists in most rural communities. This is compounded by the lack of school and public libraries and modern ICT infrastructure, which prevent children and adults from improving their education. ICT is a compulsory examinable subject for Junior High School students but most schools do not have computer laboratories and their communities also do not have Internet cafes. 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 address this 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's Public Library Innovation Programme (EIFL-PLIP).

The key aim of the project is to help children pass their exams. A second aim – equally important – is to enable students to research and retrieve information of value to local development, for example, about modern farming methods, to help their parents improve their agricultural yields and income. Students are thus encouraged to become agents of change.

The grant supported 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 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 13<sup>th</sup> 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 service has been in operation since 2012, targeting schools in under-developed parts of the municipality: Ziavi Dzogbe, Ziavi Lume, Klefe Achatime, Deme Fiave and Taviefe. Some of the schools do not have electricity; none have computer laboratories.

In less than a year (for about 31 weeks) the Volta Regional Library mobile library van travelled to 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 research and to use the eGranary. They have also learnt how to use e-mail and have created accounts. Fifty-three (53) children learnt search techniques and can now 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 10. 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 has been raised, enough to purchase seven more netbook computers and a printer for the service.

## **1.8 Achievements**

The project has made the public 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. Use of the mobile library service increased by 37.8% - from 553 to 762 during the project period. Schools from Ho Municipality and beyond continue to call for the service to be extended to them. Staff of the project have gained experience and skills, and are now able to replicate the project elsewhere. The project has also gained international recognition, prompting requests from kyrgyzstan and Liberia for briefings on what contributed to the project's success.

The project is continuing in the selected communities, and has attracted new students. The library is monitoring students' progress through skip tests (random tests). Hands on computer classes and testing will continue until the students write their BECE.

## **1.9 Challenges**

The biggest challenge facing the project was that the library did not have enough computers. This meant the pupil to computers ratio was high, and not all children could gain access to the computers to practice effectively. A second challenge, frustrating to the children, teachers and library staff, was unstable Internet connectivity in rural areas. The school timetable was disrupted by industrial action by teachers demanding salary adjustments.

An ongoing challenge for the library is the cost of maintaining the mobile van, and paying for fuel to enable regular school visits. Another challenge is high demand for the service by other schools. The library has only one van, and cannot meet demand.

## **1.10 Conclusions and lessons learned**

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 exams. However, 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.

Using public libraries to offer a service like Volta Regional Library's would be a cost-effective interim measure to help children while Government continues with its electrification programme, which could take many years. This intervention would have immediate benefits for children, especially in rural and under-developed parts of the country. As the experience of Ho has shown, it would also for the longer term, reinforce the value of public libraries to communities, as vital community resources.

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.

Once all schools have electricity and ICT, libraries would continue to play a support role to the education system, and - by providing on-going public access to ICT to youth and adults outside the education system - to community development. In addition to public libraries, school libraries need to be established in all school communities, equipped with both print and electronic resources, to enable the students do more practice and even read novels online to achieve education for all.



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