CONNECTING NYIRARUKOBWA PRIMARY SCHOOL

PROVIDING WIRELESS INTERNET ACCESS TO A SCHOOL IN BUGASERA DISTRICT, RWANDA

Nyirarukobwa Primary School in Rwanda. Photo credit: Internet Society

EXECUTIVE SUMMARY

A 2013 grant- and donor-based initiative brought connectivity, training, and information and communications technology (ICT) equipment to the Nyirarukobwa Primary School in the Bugasera district of Rwanda, an underprivileged area on the outskirts of Kigali. The school responded well to connectivity, radically increasing its ranking, test scores, and enrollment. Nyirarukobwa was meant to serve as a pilot program for a more expansive connectivity project, but it hit roadblocks in terms of support and long-term maintenance. Despite the success of the program's initial stages, it is struggling with issues of sustainable financing.

Keywords: 3G connectivity, education, schools, rural, Rwanda

CONTEXT

Technology and ICT skills were identified as the critical factors to improve human resources for Rwanda's knowledge-based economy in VISION 2020, the country's development framework. The plan aims to provide Internet access in all secondary schools and the majority of primary schools across Rwanda by 2020. According to Rwanda Education Board (REB), 531 schools, which accounts for 9 percent of the total schools in Rwanda, have access to the Internet. In 2017, the Rwandan government partnered with Microsoft to launch a three-year project that aims to deploy ICT infrastructure for the country, with the goal of providing Internet access to more than 3 million students and 61,000 teachers in 3,500 schools. They also launched smart classrooms, which feature projectors, laptops, and Internet access.

The private sector also took initiative, such as Samsung Electronics East Africa by launching solar-powered Internet schools in Bugesera District in 2014. In addition, Rwanda claimed the fastest growing One Laptop Per Child (OLPC) project adoption in Africa, which was piloted in 2007 by a Massachusetts Institute of Technology (MIT)-based nonprofit that provides rugged, low-cost personal computers to disadvantaged children in Latin America and Africa. Currently, 280,313 Rwandan children in 500 participating schools have access to a computer. The program also organized professional development workshops for teachers and seminars on the creative uses of laptops. While these initiatives have brought some key benefits to the Rwandan education system, the lack of adequate infrastructure and expertise still hinders the effectiveness of Rwanda's efforts to improve its connectivity at schools.

Rwanda			
Population (UN, 2015)	12,428,005	**Fixed broadband subscriptions (%) (ITU, 2016)**	0.17
Population density (people per sq.km) (UN, 2015)	471.87	**Mobile cellular subscriptions (%) (ITU, 2016)**	69.92
Median household income (Gallup, 2006-2012)	US$ 1,101	**Individuals using the Internet (%) (ITU, 2016)**	20
Education (Mean years of schooling) (UNDP, 2013)	Male: 3.6 Female: 3.1	**Individuals using the Internet by Gender (%) (ITU, 2016)**	N/A

PROJECT DESCRIPTION

Bringing connectivity to the Nyirarukobwa Primary School began as an initiative of the Rwanda Chapter of the Internet Society (ISOC). With a grant of $10,000 from ISOC, the school was able to purchase five computers and all the materials necessary to set up a small computer lab. This grant was also inclusive of incentives for local ISOC members to run a thorough training program in digital literacy and computer skills.

The training consisted of two modules; the first explored concepts of information and communications technology, which consisted of explanatory lessons on hardware, software, networks, security, and law, as well as basic aspects of everyday computing: emails, blogs, online communities, ergonomic postures, health, etc.). The second focused on using the computer and managing files, which provided more detailed instruction on effective individual and group computer usage and storage practices. Supplementary trainings were provided to a teacher who assumed the responsibility for ICT maintenance in order to avoid the expense of outsourcing labor.

In addition, Airtel donated two full years of Internet connectivity to the school, along with free phones for teachers to communicate with each other, and vital infrastructural improvements to the school itself: roof repairs, new desks, and new window panes. OLPC also donated 25 units to the school. With the learning environment fortified by adequate digital tools, teachers were prepared to introduce ICT and Internet learning into their classrooms for the first time.

Project details			
Technology	3G connectivity	Training	Supplementary training for ICT teachers
Year program started	2013	Cost to users	Free
Geography	Steep mountains, deep valleys	Total cost of program	Fixed: US$ 10,000 Operational: US$ 1,600 per month for 45 GB
User profile	1,500 students/teachers	Associated organizations	Airtel, Internet Society – Rwanda, Microsoft, OLPC, Samsung Electronics East Africa

PROGRESS AND RESULTS

The impact of the initiative has been unequivocally positive. More students than ever are continuing on to secondary school. Nyirarukobwa Primary School, previously the lowest ranked primary school in its district, is currently the highest ranked. And improvements to the school's buildings are better protecting students and teachers from the region's severe climates, which had been interfering with the children's ability to learn.

With the aid of the school's new printers, teachers are able to quickly generate individual worksheets that children can use to learn and progress academically. Before the ICT equipment made this possible, teachers had only the resources of the common blackboard,

handwritten materials, and large-scale repetition methods. The lack of ICT equipment makes it difficult to provide individual attention to students who may need it.

By introducing these students to the Internet at the primary school level, the project is giving them the opportunity to develop early fluency in digital literacy. Students are instructed in Internet research skills and encouraged to indulge their curiosity to become self-motivated knowledge seekers. The computers are used both in class and out too: the school provides after-school, break-time, and weekend hours for students to spend time on the Internet.

The Rwandan Ministry of Education requires students to pass its national exam in order to continue from primary to secondary school. Before gaining connectivity, it was not uncommon for zero students at the Nyirarukobwa to pass. In good years, one or two students might succeed. After connectivity, 10-to-20 students are passing the exam each year and continuing their education. Because of the school's heightened ranking, test scores, and advanced equipment, enrollment has doubled and attendance is regular. At the time the project was started, the school had 720 students; currently, it enrolls 1,415.

CHALLENGES

Lack of sustained funding – The initial ISOC grant of US$ 10,000 was enough to purchase equipment and provide training, while the Airtel donation brought two years of uninterrupted connectivity to the school and OLPC provided hardware but not connectivity. As of 2017, however, the school does not have a reliable income source to sustain connectivity into the future. Teachers are using personal funds to purchase Internet access in daily or weekly packages.

Limited physical infrastructure – While increased enrollment and participation are salutary educational developments, the resultant school overcrowding and increased class sizes are not. The school has split its school day into alternating morning and afternoon sessions to accommodate the larger student population and hired five additional teachers (18 total), but capacity remains a challenge.

NYIRARUKOBWA PRIMARY SCHOOL'S SUGGESTIONS FOR FUTURE PROJECTS

Training of ICT teachers is required for improved outcomes – The project credits its early emphasis on an organized and comprehensive training program for its learning outcomes. The project notes that training and available sources for follow-up education are vital for the efficacious use of connectivity in the classroom.

A comfortable and safe learning environment aids connectivity-related outcomes – Training is not the only necessary supplement to the introduction of connectivity and computers. This case demonstrates sensitivity and awareness of the educational impact of safe and comfortable learning environments. If students are distracted, cold, or ill at ease in their surroundings, they are less likely to learn well.

Planning for sustainability should be incorporated at the initial stages of design – The expansion phase and long-term maintenance plans were not included from the beginning stages of the project. This has resulted in an uncertain future for the school. The project team emphasizes the value of those planning connectivity projects to focus their planning as much

on the initial implementation as on future sustainability – regular funding sources, subsidies, equipment maintenance and upgrades.

SOURCES

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