

## Executive Summary

*Updates – Feb. 2013*

*Editor’s Note – Module 1 was updated during the fall of 2012 and edited in January-February 2013. This executive summary captures the information added as a result of this update process.*

### Introduction

Information and Communication Technology (ICT) increasingly makes education more accessible and more universally and equitably available to all. Many countries are realizing the importance of connecting their educational institutions to the Internet and, as a result, have developed “e-learning” and “m-learning” strategies for connecting schools and students. The updates to this toolkit module capture many of the lessons educators and e-learning specialists have gleaned from their experiences in this field.

In particular, the updates capture two trends: (1) the new attention being given to mobile learning (m-learning) technologies, which broaden the universe of potential connectivity solutions; and (2) a new emphasis on the importance of including sustainability, training and long-term funding in national school connectivity plans.

### Technology is Essential

Studies have continued to show that the introduction of ICTs in the educational process has great potential for knowledge dissemination, effective learning and the development of more efficient educational services. Personal Digital Assistants (PDAs), laptops, Pocket PCs, and mobile phones -- even material stored on CDs or USBs -- can provide interactive content to previously unreachable and remote locations. The main point is that technology is essential.

Recent developments in m-education show a positive impact from the use of mobile phones in schools. A recent GSM Association report illustrates this through a number of examples:

- In a school in the **United States** (New Mexico), teachers are using mobile computing devices to regularly assess kindergartners’ reading progress and then tailor instruction to help them develop oral fluency. Within the first three years of use, the share of students reading at benchmark levels rose from 29 per cent to 93 per cent.<sup>1</sup>
- In **India**, primary schools used mobile-phone games to help students from rural, low-income households learn English. Test scores of students using the mobile-phone games improved by nearly 60 per cent.<sup>2</sup>
- In 2012, the non-profit organization World Reader published the results of *iREAD*, its year-long, USAID-funded pilot programme in **Ghana**. The results indicated that primary

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<sup>1</sup> McKinsey & Company, *Transforming Learning through mEducation*, GSMA, April 2012.

<sup>2</sup> <http://www.gsma.com/connectedliving/wp-content/uploads/2012/04/gsamckinseytransforminglearningthroughmeducation.pdf>

school students with access to e-readers showed significant improvement in reading skills and in time spent reading, and that the programme was cost-effective over that period.<sup>3</sup>

## **The Importance of Broadband**

In 2013, there is growing appreciation that many of the benefits of e-learning are only achievable through broadband connectivity. ITU and UNESCO set up the Broadband Commission for Digital Development in May 2010 in response to UN Secretary-General Ban Ki-Moon's call to step up UN efforts to meet the Millennium Development Goals (MDGs). The Commission aims to boost the importance of broadband on the international public policy agenda and defines practical ways in which countries at all stages of development can expand broadband access, in cooperation with the private sector, to facilitate the achievement of the MDGs by 2015.

At the Broadband Leadership Summit in Geneva in October 2011, the Broadband Commission established targets for making broadband policy universal and for boosting affordability and broadband uptake, which in turn will also affect school connectivity.

## **Regional Research and Education Networks**

The role of *National Research and Education Networks* (NRENs) in providing connectivity to schools cannot be underestimated. For the last decade, NRENs have also been evolving, in many cases, into *Regional Research and Education Networks* (RRENs). NRENs and RRENs originally were established more than 20 years ago in Europe and the Americas as dedicated networks for the research and education community to support bandwidth-intensive applications in research. In recent years, however, they have been established around the world, increasingly bringing Internet connectivity to schools.<sup>4</sup>

At present, about 100 countries in the world have adopted an NREN as the centrepiece of their ICT plans for tertiary education institutions and for inter-connecting research institutes and other institutions, such as schools and hospitals.<sup>5</sup>

A *school network* also provides connectivity and access to high-quality, centralized and localized digital content for both teachers and students. Plus, the network generally provides access to educational applications, content filtering, anti-virus, centrally hosted secure email, and online security services. The advantages of connecting through a central school network are:

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<sup>3</sup> <http://www.worldreader.org/what-we-do/>

<sup>4</sup> *Regional Strategy for C@ribNET: Provision of Blueprints for the Development and Implementation of National Research and Education Networks (NRENs), Blueprint for Barbados.* Available at: [http://www.ckln.org/home/sites/default/files/Barbados\\_Blueprint\\_-\\_B\\_&\\_F\[1\]\\_0.pdf](http://www.ckln.org/home/sites/default/files/Barbados_Blueprint_-_B_&_F[1]_0.pdf)

<sup>5</sup> *Regional Strategy for C@ribNET: Provision of Blueprints for the Development and Implementation of National Research and Education Networks (NRENs), Blueprint for Barbados.* Available at: [http://www.ckln.org/home/sites/default/files/Barbados\\_Blueprint\\_-\\_B\\_&\\_F%5b1%5d\\_0.pdf](http://www.ckln.org/home/sites/default/files/Barbados_Blueprint_-_B_&_F%5b1%5d_0.pdf)

- **Speed** – Once the schools are connected, the school network will provide a rapid method for sharing and transferring files.
- **Cost** - The network versions of most software programmes are available at considerable savings when compared to buying individually licensed copies.
- **Centralized Software Management** - One of the greatest benefits of installing a network at a school is the fact that all of the software can be loaded on one computer (the file server) and shared.
- **Resource Sharing** - Through networking, the costs of peripheral equipment (printers, modems, scanners) will be reduced, since they can be shared across the network.
- **Flexible Access** - School networks allow students and teachers to access their files from computers throughout the school, and eventually, throughout the region or country.

### **Selection of Technology to Connect Schools**

There are various network considerations when connecting schools to the Internet. One is the selection of the appropriate technology to integrate ICTs into educational facilities and practices. It is important for connectivity plans to detail broadband specifications, since the requirements of schools vary tremendously.

There are numerous examples of how mobile networks have contributed to providing school connectivity. Mobile technology is increasingly helping address limitations of education in two areas: access and personalization. Mobile phones are cheaper to own and easier to run than PCs. Not surprisingly, they are gaining ground as tools for delivering teaching content. Many mobile devices are now also equipped with Wi-Fi connectivity, as well as cellular connectivity, enabling consumers to use the best (and/or cheapest) connection available to them at any given time.

Many companies and countries are also using **social media** to enhance education among school children. Enhancing education through social networking is expected to help reduce the significant numbers of school-age children in developing countries who are not receiving any formal education. Nokia launched *MoMath*, a mathematics teaching tool that targets users of the instant messaging platform Mxit, which is South Africa's most popular social media platform, with more than 10 million active users in the country.<sup>6</sup>

Satellite Broadband is recognized today as a necessary addition to technology options, especially in remote and rural areas. In Europe, for example, the European Digital Agenda has set a target of 100 per cent broadband coverage by 2013, recognizing that satellite broadband will be required to achieve this ambitious goal.

### **Sustainability**

Sustainability of ICT initiatives has increasingly been described as the sum of the inter-relationships and inter-linkages between the wider policy environment, technology, telecentre operators and managers, capacity building, content and services, networks and partnerships and community.

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<sup>6</sup> <https://projects.developer.nokia.com/Momaths>

This, too, can be applied in the school connectivity context, particularly where school connectivity is leveraged to benefit the community. The sustainability concerns of telecentres are centred on the following issues:

- **Financial** – Breaking even, profit-making, etc.
- **Social** – Community acceptance, community development and impact,
- **Organizational** – Administration and management of the telecentre, including capacity-building, infrastructure maintenance, etc.
- **Policy-related** – Whether there is a conducive policy environment related to connectivity, IT infrastructure, etc.<sup>7</sup>

### **Total Cost of Ownership**

An effective school connectivity plan must take into account the *total cost of ownership* (“TCO”). Educational objectives, actors and funding must be channeled to address the key steps that complement each other. Platform costs include more than the simple cost of acquiring computers and connectivity for schools. They also include, the cost of accessing electricity where there is no access to the main electricity grid, as well as the cost of replacing equipment. Hardware and software, peripherals, the cost of security and electricity, are also factors. There are also costs for providing and maintaining content and applications, providing and ensuring continued user training and support, maintenance and technical support and the monitoring and evaluation of the project.

### **Conclusion**

Despite the recognized worldwide importance of Internet access for educational institutions, many developing countries are finding it extremely challenging to connect their schools. Though funding is typically cited as the main reason, there are a range of other bottlenecks including non-existent or unrealistic school connectivity plans and a lack of coordination between various stakeholders.

Though school connectivity requires substantial resources, there is evidence that the many potential funding sources available are not being adequately utilized. Funding is potentially available from a variety of sources including universal service funds, government education budgets, multilateral and bilateral donors, the private sector, non-governmental organizations as well as the parents of the students themselves.

The design of well-structured school connectivity plans with realistic timetables can have a big impact on increasing school Internet access throughout the world in a cost-effective manner. Low-cost computing devices, mobile phones, applications and content stored on common servers or in the cloud, as appropriate, can be used to reduce the cost of end-user equipment, applications and content.

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<sup>7</sup> <http://www.telecentre.org/telecentre-sustainability/>

These plans should be created with input from all stakeholders to achieve success, enhance coordination and ensure that potential donors are aware of them. The plans should also be tied to monitoring and evaluation tools so they can be modified and improved with experience in order to maximize their effectiveness. Though school connectivity cannot be achieved overnight, a plan with medium-, short- and long-term objectives can provide a roadmap to the day when the target will eventually be reached.