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Helpdesk Research Report

Mobile telephony innovation to improve education service outcomes

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Question

Identify recent innovations in the use of mobile telephony to improve education service outcomes and data management. Where possible focus on application in post-conflict environments and identify emerging best practices.

Contents

1. Overview

There is a wide and growing interest in the use of mobile telephony to improve education service outcomes. This interest is by bilateral and multilateral donors, private foundations, non-governmental organisations, academic researchers and private companies, many of whom are associated with the Mobiles for Education (mEducation) Alliance. This Alliance aims to "reduce barriers to access appropriate, scalable, and low-cost mobile technologies to help improve learning outcomes in formal and non-formal education across all levels, especially in low-resource and developing country contexts" (USAID 2013a).

Mobile telephony in education is often associated with the wider use of electronic technology in education, and in some projects mobile phones are used in conjunction with other technology systems (e.g. Genevois & Sylla 2013). Mobile telephones have been used to assist in teaching students (e.g. Yacoobi 2013), training teachers (Loiret & Le Quentrec 2013) and keeping students and parents informed about school information (e.g. Lloveras & Korenblum 2012). As well as directly helping with learning, they can be useful for education-related payments, especially in environments with poor financial infrastructure (e.g. HaitiLibre 2013; BBC 2012; USAID 2013c). Some projects have used small handheld

devices that have functions similar to mobile phones (e.g. GPS, ability to run applications) but not the ability to send and receive calls and texts (e.g. Belizaire & Hermes 2012).

This first part of the report identifies the key lessons learned and recommendations for policy makers relating to the use of mobile telephony to improve education service outcomes, though with a general focus on mobile phone-assisted learning. The second part of this report identifies a number of projects that have taken place or are taking place in post-conflict environments which make use of, in some way, mobile telephony. These interventions use mobile telephony to:

- provide emergency information to students and parents (Gaza Strip: Souktel and UNESCO);
- develop and distribute an education curriculum (Afghanistan: EXE & Ustad Mobile Software);
- provide payments for parents and teachers (Haiti and Afghanistan: Mobile Payments for Education);
- train school teachers (Madagascar: Mobile Phone-Assisted Teacher Training); and
- to assist with literacy classes (Afghanistan: Using Mobile Phones to Accelerate Literacy Education).

The third section identifies a number of projects that relate to using mobile telephones and other mobile devices for data management in relation to education. These interventions use mobile telephony to:

- produce a national map of schools (School Mapping: National Mapping and Analysis of Catholic Schools in Haiti);
- monitor improvements in education (Education Quality Indicator Tracking: Edutrack); and
- produce a school census (Educational Planning: School Census by Mobile Phone Technology).

It is of note that most of the material relating to mobile telephony interventions document the nature of the project but provide little rigorous evaluative data that examines the cost-effectiveness and efficacy of them, or compares them to other types of intervention.

2. Lessons Learned and Emerging Best Practice

Recent material that synthesises lessons learned and identifies emerging best practice for mobile telephony in education, in particular on learning with mobile phones, include a 2012 survey (GSMA 2012) and a number of UNESCO Working Papers. The 2012 survey took place in Ghana, India, Morocco and Uganda, and focused on the use of handheld devices, including mobile phones, in relation to a variety of educational objectives (GSMA 2012). In a series of blog posts Trucano et al. identify key points relating to the UNESCO Working Papers (Trucano et al. 2012a) and in relation to the 2012 survey (Trucano et al. 2012b). Key lessons learned identified in this material are:

- **Schools are not the primary source of 'educational information':** Many young people have left formal education and there are often restrictions to mainstream education in these countries. Respondents consider friends and family more important as an information source, as well as television (GSMA 2012; Trucano et al. 2012b).
- **Access to phones without ownership:** Those who do not have phones have relatively easy access to a mobile phone or SIM card. There are a variety of creative sharing arrangements in place

such as SIM swapping – owning a SIM card to use on others' phones so they would not incur charges (GSMA 2012; Trucano et al. 2012b).

- **Greater access to phones than internet:** Internet-enabled smartphones are becoming more widely available in general but are still relatively rare among the groups surveyed. While most young people surveyed had regular access to mobile phones, only 44% of those surveyed had ever used the Internet (GSMA 2012; Trucano et al. 2012b). Of those who had done so, 50% did so through a mobile phone (GSMA 2012).
- **Voice calls are most favoured:** Smartphones and data enabled devices are increasing in popularity. Nonetheless, most young mobile users prefer voice calls, making them every day, and the majority of respondents believed that calls would be the most desirable method for receiving content such as educational information (GSMA 2012).
- **Mobile phones are already used to support learning:** There is often informal and *ad hoc* mobile learning that is not linked in any systematic way to formal educational delivery programmes. Examples include communication with friends about homework assignments, recording of lectures, and educational discussion via SMS (GSMA 2012; Trucano et al. 2012b).
- **Most young people see potential in mobile learning:** Skill development was cited as the number one education need by students, with language learning a close second. Reading materials were also in relatively high need. (GSMA 2012; Trucano et al. 2012b)
- **Learner anonymity is an important attribute:** Learning activities that utilise mobile phones can allow learner anonymity which is particularly important for those who lack confidence in classroom-type environments. Others liked the fact they could repeatedly access anonymously the information/lessons that they did not understand first time (GSMA 2012; Trucano et al. 2012b).
- **Barriers to use are cost but also social disapproval:** Costs of phone use and access to services is a key barrier to the adoption of mobile learning services, but disapproval of a spouse or other family members is a potential barrier as well. This may be especially so for women and girls (GSMA 2012; Trucano et al. 2012b).
- **Scepticism by parents and teachers:** Many parents and teachers tend to view mobile technology as out of place in education and potentially harmful to students, despite the fact that mobile devices are well-situated to improve and extend learning opportunities (Trucano et al. 2012a). Family members who control use of mobile phones in the family act as 'gatekeepers' and can restrict access to the phones (GSMA 2012; Trucano et al. 2012b).
- **Scepticism by other older people:** Whereas young people were positive about the potential of mobile phones for learning, older generations were significantly less so and this can include those working within the mobile industry. Such scepticism can result in a lack of commitment to mobile-phone related learning by those working within the mobile industry and an unwillingness to support the development of new services (GSMA 2012; Trucano et al. 2012b).
- **Mobile learning has unique advantages in terms of access:** Mobile technology can provide rich educational opportunities to students who have traditionally lacked access to high-quality schooling, they can help rectify educational inequities and can bridge, rather than widen, the digital divide (Trucano et al 2012a).

The report identifies a number of recommendations for policy-makers who are working with mobile telephony in education:

- **Target the whole family:** When promoting mobile learning and services, widen the focus to family members, especially parental 'gatekeepers', so they can see the programme's value and are willing to loan their handsets for the purpose (GSMA 2012; Trucano et al. 2012b).
- **Link mobile learning to current activities:** Building on existing behaviours, priorities and interests of young people will have the strongest immediate appeal to young mobile users. This could be through sport activities, music or informal social settings (GSMA 2012; Trucano et al. 2012b).
- **Incorporate advertising in mobile learning services:** Incorporating advertising can help drive down costs (GSMA 2012), though Trucano et al. (2012) recognise that this can be controversial.
- **Closer collaboration between all actors:** Governments, policy-makers and the international development community need to collaborate better to deliver mobile learning services (GSMA 2012). For mobile learning to positively impact education in a substantive way, educators and policy-makers will need to forge new partnerships with industries and stakeholders that have not historically been involved in teaching and learning (Trucano et al. 2012a).
- **Clear policy guidelines and procedures:** There is currently a dearth of national, regional and local education policies that acknowledge mobile learning, let alone embrace its potential to help students and teachers work more effectively (Trucano et al 2012a).

3. Mobile Telephony Innovation in Post-Conflict Countries

Conflict-affected environments have an intense demand for, but limited supply of, education (USAID 2013b). A 2013 workshop as part of an International Symposium on mobile phone-assisted learning highlighted a number of key points in their discussion (2013b):

- Equity can be a key concern in conflict-affected areas as it impacts on accessibility. A lack of equity due to religious or identity affiliations can undermine access.
- It is important to create robust education delivery systems capable of delivering materials prior to, during, and after conflict events.
- Use existing infrastructure (such as phone shops) to deliver content.
- Adapt activities to local context – i.e. localisation.

At present relatively few projects are undertaken in post-conflict environments. In the African and Middle East region, which is where most of the world's post-conflict countries are[1], the majority of mobile phone learning projects are concentrated in South Africa, Kenya and Uganda (UNESCO 2012a). In Asia, the post-conflict countries of Afghanistan and Nepal have much lower penetration of mobile phones compared to the rest of Asia; there is only basic infrastructure, and consequently mobile learning activities are scarce (UNESCO 2012b).

[1] Based on the World Bank Harmonized List of Fragile Situations FY2013
http://siteresources.worldbank.org/EXTLICUS/Resources/511777-1269623894864/FCSHarmonizedListFY13.pdf

The following is a list of project and interventions that have taken place or are continuing to take place in post-conflict countries:

3.1 Gaza Strip: Souktel and UNESCO

The firm Souktel, in partnership with UNESCO and in consultation with local stakeholders, developed a system that can work prior to, during, and after an attack (Lloveras & Korenblum 2012). It allows school staff to provide parents with information, and students with instructions during emergencies. This is either through a web interface when Internet access is available, or through authorised, password-protected mobile phones when it is not.

In terms of lessons learned Lloveras & Korenblum (2012) find that:

- The SMS system filled a key gap in communication, providing fast and wide-reaching information-sharing possibilities.
- There is a need for a strong coordination structure, anchored in the community. This includes school-based safety committees who could manage the system and adapt it to their needs.
- Inclusion as part of a larger intervention coordinated with the Ministry of Education creates conditions for sustainability.

The 2012 mEducation symposium workshop discussion notes that the cost of the Gaza programme is dependent on the cost of sending out text messages. They suggest that this cost be lowered by government, private sector or donor subsidies (USAID 2013b).

3.2 Afghanistan: EXE & Ustad Mobile Software

The EXE & Ustad mobile software was used to design an education technology programme in Afghanistan, despite very low levels of literacy, poor teacher capacity, and a lack of experienced programmers (Dawson 2012). EXE Mobile is an open source, point-and-click editor that gives content designers a tool for building interactive instruction programmes that do not require significant programming or technical capacity. Content created in EXE Mobile can be exported to a phone's memory card, allowing students to access information even when networks are unavailable.

The software was used to develop an interactive, mobile version of Afghanistan's existing curriculum which can run on inexpensive feature phones (not smart phones). The curriculum is too large (1.5 GB) to be downloaded from a network and must be updated from hard media (USAID 2013b). Because of this, the curricula are stored on memory cards and distributed in existing phone shops, since one in four of these shops contain at least one computer (Dawson 2012).

3.3 Haiti and Afghanistan: Mobile Payments for Education

In post-conflict Haiti and Afghanistan, education outcomes have been supported through mobile phone payments.

"Ti Manman Cheri" is a Haitian programme for families with young children in school and living in extreme poverty. It aims to reduce the financial burden of education, improve retention and school attendance of beneficiary children, as well as inject liquidity into the local economy (HaitiLibre 2013). Mothers who send their children to school regularly will receive up to USD20 a month with the transfers made via mobile phone (BBC 2012).

In Afghanistan, a mobile salary disbursement programme for public school teachers has been initiated by the Association of Mobile Money Operators in Afghanistan (AMMOA), with the support of the Ministry of Education, the Ministry of Finance and USAID (USAID 2013c). The aim of the scheme is to make the receiving of their monthly salary safe, transparent, and convenient. Teachers register for the mobile money service and are given SIM cards which are then loaded with credit and can be used for commercial transactions with local merchants. Based on the pilot's success, the programme will be scaled up to offer mobile money enabled salary payments for the 800,000 Afghan government employees nationwide.

3.4 Madagascar: Mobile Phone-Assisted Teacher Training

In Madagascar, almost half of primary teachers have not undergone initial training. The Agence universitaire de la Francophonie (AUF), along with the Institut national de formation pédagogique (INFP), Orange and the Agence française de développement (AFD) began a distance learning programme to improve teaching quality, assisted by mobile phones (Loiret & Le Quentrec 2013). Mobile phones were used to provide educational support and prevent teachers from abandoning the programme. In total, 500 phones were distributed, including 150 smartphones. The phones were used to:

- provide audio resources and free training booklets;
- provide teachers with a free-of-charge phone number they can call and send SMS texts on, to which school counsellors will respond to;
- allow participants to call other participants or their tutors (i.e. other participants tasked with the role of tutor) for free;
- receive a weekly questionnaire related to the training booklets, designed to test and maintain their motivation; and
- receive their travel expenses for group meetings, using mobile banking.

3.5 Afghanistan: Using Mobile Phones to Accelerate Literacy Education

The Afghan Institute of Learning (AIL) implemented the Mobile Literacy programme, which involved mobile phones being used to promote basic literacy among women in rural Afghanistan. The programme supplemented AIL's classroom literacy sessions with instruction delivered via text messaging (Yacoobi 2013). Fifty students were selected from two of AIL's Learning Centres in rural Afghanistan. Each student received a handset (that ran on the standard 2G system), a phone card, and a notebook. Teachers sent daily texts to the students, who read the incoming message and responded via return text message - demonstrating reading comprehension and writing skills. Students attended twice-monthly evaluation sessions to monitor progress and receive assistance, in addition to attending classes. The outcomes of the programme were:

- Learning was greatly accelerated – achieving in 4 months what normally took 18.
- All 50 students stayed in the class through the entire 4 months.
- Students noted that they were teaching their family, especially their mothers, to use the phones.
- A small number of students left the course able to read newspapers and magazines.
- The programme helped to alleviate fears of females having access to phones, by showing the communities that the class did not violate any of their cultural norms.
- It allowed the women a way to communicate when they were unable to leave their homes.

Yacoobi (2013) argues that the programme: introduced literacy to underserved women and girls; demonstrated the value of education for all; promoted economic growth and access to information for Afghan women; laid the foundations for training in computers and ICT; and increased personal security by providing a means of emergency communication.

4. Data Management

Mobile phones' capability to both explicitly and automatically collect data makes them a particularly rich data source (USAID 2013b). A workshop discussion on strengthening systems for mobile education data identified a number of key issues and challenges:

- the challenges in scaling up systems,
- the importance of providing data to key partners,
- the advantages of using text-based SMS reporting,
- the actionable nature of the gathered information, and
- the utilisation of data on an ongoing basis even after project completion.

A number of projects have looked to use mobile phones to collate, store and process data relating to education:

4.1 School Mapping: National Mapping and Analysis of Catholic Schools in Haiti

This project was designed and implemented by Catholic Relief Services (CRS) in partnership with the Episcopal Commission for Catholic Education, the University of Notre Dame, and the Haitian Ministry of Education (MoE). The project intended to assess the Catholic education system in Haiti, which provides educational opportunities to approximately 20 percent of all children in the country (Belizaire & Hermes 2012). Instead of phones, a small number of iPod mobile devices were used. The assessment's primary focus was to provide an accurate mapping of both the physical conditions of the schools as well as their surrounding areas after the 2007 earthquake, and their effectiveness at delivering educational capacity.

Data collectors received training to create forms using web applications and then transferred those forms to Apple iPod Touch devices to perform data collection. They were then brought by parish guides to their respective parishes to gather data in the form of interviews, text, video, and GPS points in various

schools. Discussion in Q&A sessions emphasised the importance of providing data to key partners, the utilisation of the data in an interactive format reviewed by the government, and the training of existing in-country staff to be able to utilise the data.

Key conclusions and lessons learned were:

- Have technical experts to conduct training.
- It is feasible to train non-technical experts to utilise this technology.
- Using technology with license agreements can be less sustainable.
- The need for battery charging.
- Ensure all necessary applications are downloaded on the iPod.
- The length of time to capture GPS varies.
- The need for troubleshooting visits to data collectors within 1 – 2 weeks of assessment.
- Create a data analysis plan at the same time as uploading the questionnaire.
- Create and distribute an iPod and GPS Cradle user manual with instructional images to all data collectors.
- Ensure national partners are adequately involved to allow a handover of tools and knowledge for future use.

4.2 Education Quality Indicator Tracking: Edutrack

EduTrack is a mobile phone-based monitoring system that uses a Rapid SMS platform to track education quality indicators in Uganda (USAID 2013b). Used by district education officers, teachers, and education practitioners, EduTrack provides almost real-time indicators that are more accurate than the current paper-based system. EduTrack is being piloted in the fourteen districts identified in the Ugandan Quality Education Initiative which had the lowest rankings.

Efforts are made to avoid self-reporting bias from the schools by triangulating data reported from head teachers, teachers, school management committee members, and, in particular, one management committee member, who is often a girls' education movement reporter serving as the external reference point. Polled on a weekly, monthly, or term basis depending on the questions, progress is tracked from each of these sources. Orientation and in-person support are provided to the users and reporters and training is provided to ensure participants in EduTrack know how to text.

4.3 Educational Planning: School Census by Mobile Phone Technology

An Education Management Information System (EMIS) can be a crucial tool to gather necessary information to develop strategic education plans, implement programmes and projects and for monitoring and evaluation of activities. Yet many countries often lack the required infrastructure for an effective EMIS. UNESCO-IIEP, Microsoft and Orange Group worked together to identify a process to gather information for a school census using mobile phones (Genevois & Sylla 2013). As of December 2012, devices and applications were ready for use in two pilot regions with 60 heads of schools trained.

5. References and Additional Information

BBC (2012) *Haiti to pay mothers school incentives via mobile*. BBC News Latin America & Caribbean. http://www.bbc.co.uk/news/world-latin-america-18245302

Belizaire, S. & Hermes, R. (2012) *Plotting and Planning: National mapping and Analysis of Catholic schools in Haiti using iPod Touch, iFormbuilder and GPS Cradle*. Presentation for 2012 mEducation Alliance International Symposium. http://www.meducationalliance.org/docs/Symposium-2012/2e_CRS_mEducation%20powerpoint.pptx

Dawson, M. (2012) *EXE Mobile: New Open Source Editor for J2ME-based mobile education and literacy in Afghanistan*. Presentation for 2012 mEducation Alliance International Symposium. http://www.meducationalliance.org/docs/Symposium-2012/1d%20paiwastoon-slides.ppt

Genevois, I. & Sylla, K. (2013) Educational planning school census by mobile phone technology. Presentation for UNESCO Mobile Learning Week 2013. http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/ICT/pdf/Genevois_Sylla.pdf

GSMA. (2012) *Shaping the Future – Realising the potential of informal learning through mobile*. London: GSMA and The MasterCard Foundation. http://mastercardfdn.org/wp-content/uploads/GSMA-and-The-MasterCard-Foundation-mLearning_Report.pdf

HaitiLibre. (2013) *Launch of "Ti Manman Cheri" in Camp Perrin, Marigot and Jacmel.* HaitiLibre News. http://www.haitilibre.com/en/news-7794-haiti-social-launch-of-ti-manman-cheri-in-camp-perrin-marigot-and-jacmel.html

Loiret, P. & Le Quentrec, E. (2013) *Formation continue des maîtres à Madagascar. Operation Apprentissage Assisté Par Mobile*. Presentation for UNESCO Mobile Learning Week 2013. http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/ICT/pdf/Loiret_Lequentrec.pdf

Lloveras, F. & Korenblum, J. (2012) *Souktel and Unesco: Strengthening Education Systems in Crisis Zones, Through Strategic Mobile Service Partnerships*. Presentation for 2012 mEducation Alliance International Symposium. http://www.meducationalliance.org/docs/Symposium-2012/1d%20Souktel%20Unesco.pptx

Trucano, M., Jimenez Iglesias, C. & Lui, K. (2012a) Surveying Mobile Learning Around the World (part one). EduTech: A World Bank Blog on ICT use in Education. Washington D.C.: World Bank. http://blogs.worldbank.org/edutech/unesco-mobile-learning-series

Trucano, M., Jimenez Iglesias, C. & Lui, K. (2012b) Surveying Mobile Learning Around the World (part two). EduTech: A World Bank Blog on ICT use in Education. Washington D.C.: World Bank. http://blogs.worldbank.org/edutech/mobile-survey2

UNESCO. (2012a) Turning On Mobile Learning in Africa and the Middle East: Illustrative Initiatives and Policy Implications. UNESCO Working Paper Series on Mobile Learning. Paris: UNESCO. http://unesdoc.unesco.org/images/0021/002163/216359E.pdf

UNESCO. (2012b) Turning On Mobile Learning in Asia: Illustrative Initiatives and Policy Implications. UNESCO Working Paper Series on Mobile Learning. Paris: UNESCO. http://unesdoc.unesco.org/images/0021/002162/216283E.pdf

USAID (2013a) *Mobiles for Education (mEducation) Alliance Homepage*. USAID. http://www.meducationalliance.org/home

USAID (2013b) *2012 mEducation Alliance International Symposium: Partnering for Scale and Impact. Summary Report.* USAID and Aguirre Division of JBS International, Inc. http://www.meducationalliance.org/sites/default/files/2012_meducation_alliance_international_symposium_summary_report.pdf

USAID (2013c) *Public School Teachers' Salary Payment Goes Mobile*. USAID. http://afghanistan.usaid.gov/en/USAID/Article/2948/Public_School_Teachers_Salary_Disbursement_Goes_Mobile

Yacoobi, S. (2013) *Outline of Dr. Sakena Yacoobi's Speech to UNESCO Mobile Learning Week*. Prepared for UNESCO Mobile Learning Week 2013 http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/ICT/pdf/Yacoobi.pdf

Key websites

- USAID – mEducation (Mobiles for Education) Alliance: http://www.meducationalliance.org/home
- World Bank – The Use of Mobile Phones in Education in Developing Countries: http://go.worldbank.org/2Y63OQHOG0
- UNESCO – ICT in Education: Mobile Learning Publications: http://www.unesco.org/new/en/unesco/themes/icts/m4ed/mobile-learning-resources/unescomobilelearningseries

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