Community and informal learning, and skills development

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The mobile learning community has the potential and responsibility to bring informal and community-based learning to the hard-to-reach and those experiencing socio-economic, cultural, and ecological uncertainty. The capabilities of mobile technologies, on their own or blended with other local and sustainable technologies, have opened up avenues for transformational change founded on personal, vocational, cultural, economic, social, and civic improvement of individuals and groups. The exponential growth in mobile penetration[11] and handset ownership across the globe coupled with expanding mobile network coverage, offered by competitive mobile network operators, creates an environment in which the immense potential of mobile learning in overcoming the global learning challenges can be realized.

Informal learning via mobile technologies creates a vehicle by which individuals and groups affected by natural disasters, warfare and conflict, economic shocks, ill health, discrimination, and violence can access information, ideas, opinions and knowledge. Mobile devices can thus open doors to equity and welfare by connecting people to aid, resources, advice, supports, and by giving them a voice. Moreover, handheld devices can become an engine of growth by facilitating equitable access to quality education for children, youth, and adults[2], and consequently empowering them with literacy, numeracy, essential life and lifelong learning skills. The use of mobile technologies can now embrace members of marginalized groups and those who have suffered rejection and exclusion from education. Informal learning via mobiles can permeate across many physically or culturally impenetrable barriers to liberate, empower, provide, and help people reach their potential.

Nevertheless, the magnitude of the challenge of taking mobile learning to those in need cannot be underestimated, especially when targeting those hard-to-reach. The various aspects of accessibility have to be considered, including the potential users' digital literacy deficiencies and their preparedness to utilize mobile resources. It is equally imperative to ensure that, while "persuading and presenting" the benefits of mobile learning interventions to individuals or communities, a partnership is established respecting their specific interests, as well as cultural and socio-economic contexts. Successful educational interventions targeting individual and community learning necessitate attention to the particular problems that they are addressing as well as their settings. More listening than telling is essential to achieve outcomes that benefit the learners.

The next section of this article provides a definition of informal learning before moving to a discussion of community learning and the pivotal role of dialogue in the development and provision of education for the community. Subsequently, examples of hard-to-reach communities and mobile learning interventions suitable for these groups are presented and then illustrated with selected case studies. The latter sections focus on the key benefits, barriers, and recommendations with regard to the usage of mobile devices for informal and community learning as well as skill development.

Informal learning and mobiles

Informal learning occurs throughout life, and daily interactions with other people, including individual and community activities, such as learning cultural norms, language, or even how to prepare a healthy meal. Informal learning is an integral part of life and has also been identified as a vital social phenomenon[3]. This article adopts Livingston's[4] definition of informal learning as all "forms of intentional or tacit learning in which we engage either individually or collectively without direct reliance on a teacher or externally

organized curriculum". Livingston refers to both self-directed and collective informal learning, as well as intentional and unintentional informal learning. Tacit learning is so integrated in other activities that it is impossible to distinguish it as an act of acquiring new understanding, knowledge, or skill, for instance when communicating via mobile in a rescue operation. This discussion of the role of mobile technologies in informal learning also includes incidental learning, which occurs unintentionally; however, eventually the learner becomes aware that learning has taken place. Livingston explains that much of the informal learning occurs at irregular times and spaces, and at moments of transitions as well as at other major influential events in life. While people commonly undertake informal learning to gain desired knowledge and skill, they also might engage in learning ad hoc in response to a crisis or in search for solutions to urgent issues or situational needs. All in all, learning "at any time and in any place, in everyday life"[5] might arise from individual and collective goals, either explicit educational objectives or plain survival goals brought about by a random situation, when the aims and processes of learning might be not explicit. Unintentional mobile learning, from unanticipated learning opportunities or unforeseen events, can result in learning that is situated, contextual, and social.

Community learning and mobiles

The community learning process, with or without assistance of technology, is principally about people helping other people and connecting with them. Mobile devices provide an on-demand link to others within and outside our own communities. They enable exchange of information and conversation, which can mediate learning and skill acquisition effecting personal growth and social transformation. Freire[6] posited that the powerless could accomplish freedom and change as a result of critical reflection and informed action. He postulated that by collaborating and sharing knowledge with the least powerful in society, they become more autonomous and empowered. From Freire's perspective, change toward greater equality and social justice presupposes community-based learning based on listening to the community and open dialogue. Community-based informal learning may enable people to transform themselves by increasing the capacity of individuals and groups of all ages to improve their quality of life. The key to successful individual or community informal mobile learning is the ability to reach all community members and ensure their participation in the democratic processes of mobile content creation, selection, and delivery. Moreover, such educational interventions need to be developed through consultation with communities and other stakeholders as well as with respect to the communal coherence and local networks. Consequently, mobile devices should serve not only as a platform for delivery of educational interventions but also as a network for communication and feedback exchange within the community and with the outside participants. Effective community-based learning necessitates collective action requiring extensive personal contact, regular interaction, and trust enabling mutual aid.

Community learning, although often associated merely with socio-economically disadvantaged individuals and poorer areas, has been adopted widely reaching members of regional and global communities, especially those outside the formal education grid. Mobile devices add another dimension to such informal learning, namely the possibility of linking dispersed communities, connecting them from virtually anywhere, and networking them on-demand in the time when information or support is critical to their survival. Thus, networks among those with similar problems or interests can be built, and new ad-hoc communities created. The use of mobile devices enables individuals and groups who, due to cultural, physical, socio-economic or health barriers, are prevented from participating in learning activities and discussions in person, to voice their needs, and contribute their perspectives. This may include women with limited rights, young sex workers, and those with physical or mental disabilities. Mobiles also become indispensable in more urgent circumstances, such as ecological disasters or military conflicts, when people join their forces to save lives and sustain their safety. Mobile technologies often serve as the sole lifeline and source of lifeblood information for the people united in their struggles. As these people connect, cooperate, and support each other, they co-create new knowledge and help each other acquire new skills, in the course of a rather informal and unintentional learning process.

Many of these communities have limited resources such as money and expertise, technical savvy, expensive hardware, and reliable infrastructure, including Internet access or even electricity. However, they may have access to mobile phones through which they can form and enter their virtual community – their mobile community of practice that in turn becomes their informal community of learners, who share needs, goals and beliefs, and who actively engage in learning from one another. Members of these communities are interdependent in that they have a joint purpose and responsibility for learning while sustaining a mutually respectful and cohesive environment. Mobile devices can serve as the platform for their discourse and for sharing resources. An essential component for successful learning of such groups and individuals is a two-way communication and flow of information - the ability to reach them through their mobiles.

Hard-to-reach

The target population depicted in this article can be characterized as hard-to-reach, for diverse reasons and to a varied degree. For example, the hard-to-reach could include illiterate adults in a remote village in Africa or Asia, victims of the earthquake in Haiti, and women trafficked and exploited in Canada; all who may be hard to reach using traditional and conventional methods. The various causes for this inaccessibility can be grouped into five categories (Table 2.1):

1.   demographics (e.g., dispersed farmers, the elderly, living in remote areas, nomadic, poor);

2.   socio-cultural (e.g., minority ethnic groups, illiterate, sex workers, homeless, immigrants, drug users);

3.   behavioural and attitudinal (e.g., illegal workers, homeless, the disengaged);

4.   health-related (e.g., the disabled, visually impaired, autistic), and the less permanent category;

5.   situational (e.g., earthquake victims, displaced, dispossessed).

Hard-to-reach audiences might be uninformed or information poor. They are liable to be distrustful and uncooperative owing to their previous experiences. Being disadvantaged in one way or another, the hard-to-reach often prove challenging and expensive to connect with. They are likely to be underserved due to a lack of services available to them or their difficulty in accessing the existing supports. Therefore, it is imperative to invest creativity and out-of-the-box thinking in the development of strategies to reach and include these people. They need support to raise their awareness of the existing interventions and ensure their preparedness to utilize the mobile learning resources available to them or created specifically for them.

Exchanging aid messages after the earthquake in Haiti

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Using mobile networks to promote consciousness and knowledge facilitates personal and collective development, thus bridging socio-economic and cultural differences. Once potential learners are willing and ready to join the virtual human network, mobiles can be used as mediators of the learning process as well as pointers to relevant resources and supports. Engagement in an effective learning experience fosters acquisition of lifelong learning skills and, in turn, sustainable personal or communal transformation.

Table 2.1 provides an overview of the hard-to-reach communities alongside examples of subgroups and case studies demonstrating the positive impact of using mobile devices for informal/community learning and skill acquisition. Selected case studies, representing a cross-section of hard-to-reach communities, are discussed below.

Table 2.1: Hard-to-reach communities

Category	Characteristics	Examples (subgroups)	Case studies/Mobile tools and services[a]
Demographics The quantity and characteristics of an individual/ group	Gender, age, ethnicity, nationality, knowledge of languages, mobility, assets, employment status, location, income level, way of living, educational level, faith/religion	Widely dispersed farmers, the elderly, living in remote areas, the rural, unemployed, women, nomadic, poor, indigenous, faith based communities	Common sense net 2.0: http://wiki.epfl.ch/csn2/description Yoza Cellphone Stories: www.praekeltfoundation.org/yoza.html Lifelong Learning for Farmers (L3F)- COL: http://bit.ly/1fYC1d9, http://bit.ly/1do8vg2 Dr Math on MXit: http://bit.ly/PVE4p6 Magpi: www.datadyne.org/magpi-mobile/ The Mobile Alliance for Maternal Action (MAMA): www.askmama.co.za/
Socio-cultural The way of life of an individual/ group	Cultural background, social/cultural status, social visibility/ invisibility, language spoken, social respect/acceptance or prejudice, religious bias/ intolerance, gender stereotyping	Minority ethnic groups, illiterate, sex workers, homeless, immigrants, indigenous, drug users, the disempowered young, political refugees, victims of violence, LGBT	BBC Janala: www.bbcjanala.com/ PAJE-Nièta: Youth Entrepreneurs Project: http://blog.usaid.gov/2013/08/preparing-youth-for-employment/ MASELTOV: www.maseltov.eu/ FrontlineSMS: www.frontlinesms.com/ Pesinet: www.pesinet.org/wp/ Sexual Exploitation Outreach with Text Messaging: http://bit.ly/1lxfeJ6 Tell-it-True:http://bit.ly/1jPHfbY
Behavioural and attitudinal The manner they function or operate, their beliefs, and attitudes	Distrust toward others, governments, organizations, (un)willingness, (un)awareness, (ir)responsible, (il)legal, (un)stable, (un)cooperative, dis(engaged), (dis)organized, (un)motivated, distressed, (non)aggressive, addicted	Illegal workers, sex workers, homeless, the disengaged, marginal	Project Masiluleke: www.praekeltfoundation.org/projectm.html MiFinder: www.mifinderapp.com/ Sexual Exploitation Outreach with Text Messaging: http://bit.ly/1lxfeJ6
Health-related Experiencing limitations due to health issues	Physically disabled, mentally disabled, chronically ill, special needs, victims of epidemics	Ill, mentally disables, autistic, visually/hearing impaired Impairments due to genetics, diseases, and/or accidents	TxtAlert: http://www.praekeltfoundation.org/txtalert.html MTN Kick Out Malaria: http://bit.ly/1hYxwjv Camp Discovery app: http://bit.ly/O74dzW ChatSalud: http://bit.ly/1gPxHuL CycleTel™: http://www.cycletel.org/; http://bit.ly/MLH4SK Health and disability apps: http://www.disabled-world.com/assistivedevices/apps/
Situational Temporarily constrained by ecological, socio-economic, political disaster/ unrest	Victims and workers in places of natural disasters, warfare, political conflicts, socio-economic outbreaks, economic and ecological uncertainty and stress	Earthquake victims, displaced, dispossessed, disrupted, displaced	FrontlineSMS to improve service delivery after floods in Pakistan: http://bit.ly/NS1GcV FrontlineSMS to improve food aid delivery to refugees: http://bit.ly/1f45bTE Refugees United: http://bit.ly/MLPARz Global MedAid (GMA): www.globalmedaid.com/about-us-2/

Note: [a] Not exclusive to the categories in which they are mentioned, many of these tools and services have multiple uses. Also, examples (subgroups) are not mutually exclusive to each category.

Case studies: Harnessing the power of mobile devices

Mobile devices enable learning and skill acquisition by connecting people to others and to information. Similarly, numerous Mobiles for Development (M4D) initiatives have joined communities across regional and global networks to support underserved people in emerging markets in their pursuit of socio-economic growth, for instance mHealth, mAgri, mWomen or mobiles for banking and for employment[7] (discussed in more detail in Article 6). Some specific examples include the Magpi[8] mobile data collection system, used in more than 170 countries; it provides low-cost access to real-life data for commerce, agriculture, conservation

and education. It has been used to gather public health information for monitoring and assessment as well as to prepare communities for disease threats and prevent widespread epidemics. In the same vein, FrontlineSMS[9] software, which collects and distributes information via text messages, has been used for monitoring national elections in Nigeria amongst other countries, to report emergency information in the 2010 Haitian earthquake, and for communication between beneficiaries and aid providers to deliver food to refugees in the Western Sahara, amongst plentiful other uses. Many mobile interventions address the needs of farmers to cooperatively enhance the information flow and knowledge management within their local and global community. One of such projects is the Common sense net 2.0[10] aiming to improve the livelihood of marginal farmers in India through a mobile application designed for both illiterate and literate farmers to share ideas and vital information about agriculture. Although not designed with explicit educational goals in mind, such M4D and rescue programs certainly contribute to knowledge and skill building. By interacting with content and people in a variety of life situations relevant to their survival and self-improvement, mobile users benefit from an unintentional informal learning process bringing about new knowledge and skills.

At the same time, numerous mobile interventions are aimed specifically at supporting informal and community learning as well as skill development. A handful of these solutions are presented below with additional ones in Table 2.1. In terms of demographically hard-to-reach groups, projects like BBC Janala[11], serving over 26 million Bangladeshi, provide English language lessons through mobile phones and a combination of other media to increase learners' chances of a better future. Sesame Workshop Initiatives India Pvt. Ltd.[12] has reached 1.9 million marginalized children in India through community radio and telephone-based systems to deliver literacy, numeracy and healthy habits content and prepare them for school and life. The PAJE-Nièta: Youth Entrepreneurs Project[13] in Mali targets unemployed out-of-school youth to become more educated, economically productive, and civically engaged in their communities. It serves over 12 000 rural out-of-school Malians age 14–25 by offering multimedia applications pre-loaded on their mobile phones. These and similar mobile learning initiatives open opportunities to illiterate and out-of-school adults, youth, and working children who are often wage earners contributing a substantial portion to the family's income. They cannot afford time or extra costs associated with formal education; even if they could, for the most part there are no schools to attend in the slums and villages they inhabit. The following case study (Box 2.1), the MASELTOV project[14], further illustrates the barriers to learning and inclusion amongst those hard to reach for socio-cultural reasons.

Box 2.1: The MASELTOV project

The MASELTOV project, funded through a EU research grant to The Open University, aimed to foster local community building and integration of immigrant populations into the host country by improving the skills and local knowledge of immigrants living in European cities. The project targeted migrant populations with low literacy and at risk of remaining on the margins of society - excluded from full participation in their new country. The target group have access to mobile phones, but represent varied digital literacy levels. The project edto develop integrated mobile navigation, information, learning, gaming and social network services on smartphones providing assistance on essential topics such as the healthcare system or transport services. The final outcome of the project, namely the MASELTOV app offers an ecological suite of ten most relevant services, including, (1) forum, (2) help radar, (3) information service, (4) pedestrian navigation, (5) transportation navigation, (6) places of interest, (7) translation tool, (8) language learning, (9) serious game, and (10) recommendation service. It also provides help in moving around an unfamiliar city, making contact with people and learning about the local culture. *"Through technology-mediated persuasion and social networking, we will offer support and help change attitudes and behaviours of migrant people living in Europe,"* concluded Professor Agnes Kukulska-Hulme, who led The Open University's contribution.

By the same token, informal and community learning via mobiles can reach people living on the street, the elderly, refugees, physically or mentally impaired (using assistive technologies), or women in more restrictive cultures, who often do not even own phones and have to rely on others and their community for access to mobile technologies. In fact, according to Groupe Speciale Mobile Association (GSMA) there is a "mobile gender gap" in low- and middle-income countries with 21 per cent less women than men owning a mobile phone (37 per cent in Asia)[15]. Many mobile interventions have been launched globally with the aim of liberating and educating women; for instance, CycleTel™[16] in India: an SMS-based family planning method available to women via their mobile phones, Pesinet[17]: a women-run mobile service that brings healthcare to infants in Mali, and Praekelt Foundation projects[18] in South Africa delivering vital health information to new and expectant mothers through mobile phones. Another Praekelt Foundation mobile learning tool, which presents an unprecedented opportunity to increase access to healthcare information and save lives, is described below (Box 2.2).

Mobile technologies have also proven advantageous in extending learning to those who have been underserved due to health reasons. Selected mobile apps for autistic children can serve as an encouraging illustration of how mobile learning engages people with disabilities by enhancing their motivation and self-esteem – a catalyzer for improving their learning and performance. The Camp Discovery app[19] offers fun learning for children with Autism Spectrum Disorders (ASD) who learn by matching, sorting, and completing receptive tasks. Likewise, the

following two examples can be gateways to effective informal learning: apps for visually impaired using text-to-speech technologies, and MiFinder[20] designed for diverse communities, including the disabled, to find each other, make friends, and gain social support in real time. Many other benefits of informal and community mobile learning are listed in Box 2.3.

Depending on the tools in their pockets, there are ready-available solutions as well as potentially available resources to support and overcome barriers, to take learning to communities where it has never been before, to cross the boundaries of contexts and attitudes, to connect across personal, socio-economic, health-related, and cultural barriers.

Barriers and issues

As mobiles continue to be more accessible and reliable, sustainable models for extending and supporting mobile learning should become increasingly feasible. However, there are several limitations to the ubiquitous nature of mobile learning. Apart from multiple issues related to developing human capacity (shortage of tutors, experts, teachers) and educational content, the key challenges would still include the issues of affordability and accessibility of devices and services, connectivity and electricity (sometimes solved by communities through home-grown solutions), and the limited usability of some of the cheaper devices. Many potential learners cannot access mobile resources as a result of their inadequate literacies or phone access restrictions for reasons beyond their control, such as children

Box 2.2: Young Africa Live (YAL)

The mobile portal was developed by Praekelt Foundation, supported and hosted by Vodafone Live, and it was launched on Dec 1, 2009 - World AIDS Day. Its aim is to provide a space where young South Africans can talk about issues relevant to their daily lives: love, sex, relationships, gender and cultural issues, as well as HIV/AIDS. The three key objectives of the mobile platform are to share information and educate, generate discussion, and promote HIV testing. YAL offers a combination of regularly updated dynamic stories and live chats/blogs, as well as a series of permanent content pieces providing the essential facts around HIV and AIDS. It also includes helpline numbers and contact information for referral organizations who can support YAL-users in times of need.

"A tribe is a group of people connected to one another, connected to an idea." Seth Godin

Box 2.3: The key benefits of informal and community mobile learning

- Facilitates learning across demographic, socio-economic, behavioural/attitudinal, health, and cultural barriers.

- Promotes connection, exchange of information and knowledge, dialogue over virtual networks.

- Combines horizontal transfer of knowledge with vertical integration.

- Reduces informational asymmetries and the educational gap.

- Provides lifelong learning skills and self-directed learning competences.

- Fosters digital inclusion leading to socio-economic inclusion and transformation.

- Strengthens regional and global communities, their knowledge, and social capital.

- Provides tools critical to transformative change and development.

- Empowers underprivileged groups and improves their livelihoods.

- Builds new networks and virtual communities, locally and globally.

- Facilitates disaster response and rescue operations.

- Eases disaster, socio-economic, cultural crisis impact.

- Fosters participatory learning benefiting from diverse talents, resources, and perspectives.

- Creates long-term networks of relationships.

- Promotes trust, reciprocity, and cooperation of participants and stakeholders.

- Aggregates actual and potential resources into knowledge repositories, self-help groups, advisory bodies, and community-based rescue/aid initiatives.

- Complements the existing learning systems by delivering on-demand relevant and timely content and discussion.

of poor families who, being at the bottom of the "chain of command", are prevented from using mobiles even if these are provided by a mobile learning project. Related to the issue of access is the need for tutors to introduce supports available via mobiles to special needs groups, for instance the disabled or illiterate, so that they can start on their path to informal learning. It has always been an instructional challenge to provide learning supports and scaffolds to distance and dispersed learners, especially those with special needs. Some hard-to-reach groups are, in fact, hidden away from the community and isolated (e.g., mentally disabled in some cultures), therefore inaccessible. Other barriers that limit or prevent connecting to mobile learning resources could include lack of mobility, security, confidence, awareness, or privacy (e.g., women in patriarchal cultures).

In addition, addressing the needs of unfamiliar and dispersed populations situated in unfamiliar cultural and logistical contexts without their input is likely to generate unsatisfactory results. Balancing out the right blend of regional

knowledge and global knowledge to provide learning that is relevant in the local environment is another important consideration and solution strategy. Disparities also exist in mobile technology infrastructure and the handsets at the users' disposal. What can be done to ensure that the divide is not deepened between the haves and have-nots? Finally, the same mobile tools that can be effective in liberating and embracing people can become weapons of discrimination and oppression. They can be used by the marginalized for dishonest or even criminal activities; hence, some of the possible destructive by-products of people connecting over their mobiles must be considered. The next section offers some recommendations on how to utilize mobiles to solve rather than intensify regional and global problems.

Conclusions and recommendations

It does take a village to raise a child and it takes a nation to sustain that village. In turn, it takes the global community to *mobilize* knowledge, innovation, and people power to effect inclusive education and social change. Mobile technology is a real game-changer in terms of reaching the hard-to-reach and connecting them across the local and global communities. It has the potential to broaden access to information, knowledge, people, services, and assistance by affording new channels for communication and innovative forms of learning. It offers fast, safe, and economical routes to deliver food, medicine, and disaster relief in times of economic and ecological crisis or uncertainty. Mobiles enable inclusive education, skill acquisition, entrepreneurial opportunities, and, in turn, personal, community, and global development. Through more transparent communication and information exchange with governments and community-based organizations, mobile networks empower individuals and groups. In addition, they encourage participation and a sense of security by providing unique digital identities and membership in virtual communities of practice. Harnessing mobile technologies to provide cost-effective non-invasive informal learning to marginalized individuals and communities has proven feasible through numerous collaborative projects

involving Mobile Network Operators (MNOs), handset manufacturers, NGOs, educational and government institutions, as well as local people. Several of them have been grassroots initiatives, benefiting from an invaluable insight into the local context and resources, however, often lacking the long-term capacity needed to sustain the intervention. In terms of sustainability, it takes innovative business models incorporating the expertise and resources of all partners along with their commitment to long-term goals. Such interdisciplinary initiatives should be aimed to construct, through in-situ testing and evaluation, a sound replicable framework for provision of community and informal learning and also training. Locally-applicable frameworks should be then collectively tested for broader impact by a consortium of projects. Proven models and frameworks should be shared and openly discussed by alliances of mobile learning practitioners, MNOs, corporates, agencies and organizations, such as mEducation Alliance, UNESCO, and the WISE platform, who should take the ownership of the success of these mobile learning frameworks and include them as their strategic goals.

On a related note, new funding avenues should be explored to involve more community-based organizations, angel investors, associations, charities, entrepreneurs, and businesses. In some cases, local learners could contribute the resources generated through the mobile initiatives enabled by these partnerships. It is imperative to engage local communities and learners also in other aspects of the projects to ensure that the mobile interventions are relevant, practical, and sustainable in their context. Insiders can often point to the best solutions and help advocate mobile learning opportunities to the community members. Working closely with potential learners also promotes their motivation and learner agency. While consultation with the people is vital, the commitment of local governments and organizations is also needed to succeed. States and regulators are accountable for their citizens' welfare. Therefore, it is advisable to partner, collaborate, and problem solve with local governments to provide mobile learning opportunities as a coordinated effort.

Reports of mobile learning initiatives demonstrate that people, even those living in extreme destitution, are willing to spend money on their mobile devices[21]. Users do not consider mobile phones a luxury but rather a necessity. The social and technological capacity should be leveraged to provide community and informal learning to those who might otherwise remain at the margins of education.

Box 2.4: More didactic recommendations

- Focus on the needs of poor and marginalized communities, including people with disabilities as they have the most to gain from mobile learning.

- Maximize the impact of mobile learning interventions - customize and ground them in the needs and cultures of specific targeted groups rather than applying blanket solutions.

- Invest in sustainable educational goals rather than short-lived trendy approaches.

- Avoid the perpetual pilot syndrome by building solid long-term partnerships.

- Minimize the cost of interventions by utilizing the existing local expertise and human networks.

- Communicate and collaborate with potential learners; include them in design and development decisions to create meaningful solutions reflecting their current realities, long-term and immediate needs.

Endnotes

1   Mobile-cellular subscriptions penetration rates stand at 97% globally. The total number of mobile <u>broadband</u> subscriptions is expected to reach 3.6 billion by the end of 2016 (with the global penetration rate reaching 49.4%, a value that has increased 12 times since 2007. Mobile broadband subscriptions penetration rates: in developed countries – 90.3% and in developing countries- 40.9%. – ITU (2016). *The world in 2016: ITC facts and figures*.

2   As per the goals of Education for All Global Monitoring Report (UNESCO, 2010).

3   Tough A. (1979). *The Adult's Learning Projects*. Ontario: Ontario Institute for Studies in Education.

4   Livingstone, D. (2006). Informal learning. In: Z. Bekerman, N.C. Burbules, and D. Silberman-Keller, eds., *Learning in places: The informal education reader*, 1st ed. Peter Lang., pp. 203-227.

5   UNESCO. (2005). *NFE-MIS Handbook. Developing a Sub-National Non-Formal Education Management Information System*. Module 1. Paris: UNESCO, Division of Basic Education, p. 4.

6   Freire, P. (1972). *Pedagogy of the Oppressed*. Harmondsworth: Penguin.

7   Specific examples available at www.gsma.com/mobilefordevelopment/

8   www.datadyne.org/magpi-mobile/

9   www.frontlinesms.com/

10   http://wiki.epfl.ch/csn2/description

11   www.bbcjanala.com/

12   www.sesameworkshopindia.org

13   http://blog.usaid.gov/2013/08/preparing-youth-for-employment/

14   www.maseltov.eu/

15   www.scientificamerican.com/article/mobile-phones-for-women/

16   www.cycletel.org/

17   www.pesinet.org/wp/

18   www.praekeltfoundation.org/projects.html

19   www.centerforautism.com/resources.aspx#tab5

20   www.mifinderapp.com/

21   For instance, in Tanzania, one of the poorest countries in the world, the mobile penetration in 2013 reached close to 60 % (TCRA, 2013); low-income earners often spend more than 30% of their monthly formal income on mobile phone use; they would forgo other important things to ensure access to mobile communications (Mpogole et al, 2008). Mpogole, H., Usanga, H., and Tedre, M. (2008). Mobile phones and poverty alleviation: A survey study in rural Tanzania. In *Proceedings of 1st International Conference on M4D Mobile Communication Technology for Development*. (62-72). Available at: www.diva-portal.org/smash/get/diva2:133042/FULLTEXT01.pdf#page=69. TCRA (2013). Quarterly Telecom Statistics: Quarter 1 (September 2013) Report. Available at: www.tcra.go.tz/images/documents/telecommunication/telecomStatsSept13.pdf.