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Mobile Phones & Literacy

Empowerment in Women's Hands

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A Cross-Case Analysis of Nine Experiences

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FOREWORD

This Report is an invitation to a renewed commitment to human development leading to equal and just societies by empowering those most in need. It presents a review examining the extent to which the lives of girls and women in disadvantaged rural communities in three world regions were changed by mobile phone technology aimed at developing their literacy skills. The Report proposes an approach to women's and girls' empowerment as the creation of conditions that will enable them to improve their lives. With this understanding, it looks at how mobile phones enhanced literacy for women, and consequently their voice, participation and opportunities for decent work.

Literate societies go beyond literacy rates: they enable individuals and communities to acquire, develop, use and sustain literacy skills in ways relevant to quality schooling, lifelong learning and development opportunities. UNESCO reaffirms literacy as inherent to the right to education and this to development. Literate societies have a higher probability of eradicating poverty while providing conditions for people to equally achieve long and healthy lives, gainful employment and an active civic participation in democratic contexts.

This Report is also a call to steer Information and Communication Technologies (ICTs) in ways that strengthen people-centred and inclusive Information Societies, with equal opportunities for women and men to access and critically use information as part of further knowledge creation. Equal digital opportunities for all women and men together with sustaining literacy skills increase the potential for information and knowledge to be used in ways that improve the quality of life for all.

A key contribution of this Report is the identification of challenges encountered across nine projects and the recommendations derived from these experiences on how mobile phones can potentially enhance women's literacy, leading to their empowerment in poor rural communities. These recommendations highlight a variety of socio-cultural, educational and economic factors that mobile learning needs to consider when aiming to empower women and girls as they access and use mobile devices for educational purposes. They also underline the importance of quality content in mobile learning, and how it is measured, in order to denote quality beyond quantity as part of learning.

The Report's analytical framework also provides a useful lens to examine mobile learning projects, by taking into consideration the contexts in which projects were implemented; the implications of literacy and empowerment conceptions in project rationales; the mobile learning process; and issues of project sustainability.

Positive steps and solutions identified by the Report across the nine cases exemplify the promising potential of mobile phone technology in helping women who are at great disadvantage in their communities to retain acquired basic skills. Nevertheless, as the Report concludes, far more needs to be known not only on how mobile phone technology facilitates people's acquirement of literacy skills, but also on how these can be sustained, guided by the goals of human development and gender equality.

For this, mobile phone enhanced literacy projects can have a more significant impact if they approach literacy beyond illiterate and literate dichotomies; instead literacy must be considered with application and relevance to socio-economic and cultural contexts as well as daily practices of empowerment. These include enhanced opportunities for rural employment and livelihoods for women. We learn with this Report that in addition to overcoming issues of access, mobile learning must link its content to a wider and deeper purpose that aims to change the lives of learners; that is, with conditions that enable women to access further educational opportunities, livelihoods, voice and participation in their communities.

We are confident that this Report provides a solid basis of evidence to recommit our policies and practices to strengthening the potential of ICTs in reaching and improving the lives of those most in need in our societies, particularly women and girls.

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EXECUTIVE SUMMARY

Human development is a basis for international efforts aiming to improve the well-being of individuals as active participants and beneficiaries of just and equal societies. The empowerment of women and girls implies the process of enlarging their capability to choose a better livelihood within a wide range of opportunities. Education, as a public good and a human right, plays a key role in achieving this by increasing women's voice and participation and their chances of obtaining decent work. As part of this process, Information and Communication Technologies (ICTs) in our societies are increasingly recognized by many as potentially improving the lives of communities and groups including women and girls in disadvantaged contexts.

The purpose of the report "*Mobile Phones & Literacy: Empowerment in Women's Hands – A Cross-Analysis of Nine Mobile Experiences*" is to understand the extent to which mobile phone technology enhances or develops literacy in ways that empower women and girls. Conceptually, the report is structured taking into consideration three main axes: literacy in its ample meanings and practices; mobile phone technology and mobile learning; the empowerment of women and girls in terms of human development. Mobile phone technology and literacy can potentially lead to varying degrees of empowerment in terms of women's voice and participation and employment opportunities.

The report is based on a cross-case analysis of mobile phone learning projects in nine rural communities in sub-Saharan Africa (3 projects – Niger, Senegal, Somalia), Asia (5 projects – Afghanistan, Cambodia, Pakistan and two projects in India) and in the Arab States (Morocco). The analytical framework applied to the nine cases examines their outcomes and trends taking into consideration implementation contexts; conceptions of literacy and empowerment; mobile learning processes and sustainability. Sources of information for this analysis are mainly secondary ones including project-related reports/studies as well as peer-reviewed publications and conference proceedings. The projects focus to varying degrees on enhancing literacy in women and girls and on a wider target population (e.g. youth or adults) in which women represented a considerable proportion.

The nine projects showed project implementation contexts encountering rural communities that are extremely poor, young and unemployed and with their

daily lives being regulated by traditional social-cultural norms in which girls' and women's freedom and opportunities are considerably constrained. Populations in the project contexts were characterized as well by multiple ethnicities and linguistic diversity.

Mobile phones in the projects reviewed were accessed and used as a communication and learning tool to enhance new or existing literacy endeavours within varying conceptions of the latter. With a predominant reliance on information transfer, most of the projects aimed at facilitating the acquisition of neutral/autonomous literacy skills – the ability to read/write a simple statement – by encouraging learners to practice and retain these skills via SMS texting. Despite an initial increase in skills, the learning process remained weak in depth, with little learner-content interaction and most of all, with limited retention and functional application and transformation of literacy skills into further learning, voice and participation and employment opportunities. Educational, socio-economic and cultural contextual factors need to be incorporated more evidently as part of the mobile learning process. Only two projects used mobile phone technology as part of a continuous and collective learning strategy leading to individual and social change with literacy connected to women's active participation in improved livelihood practices. Overall, further ground needs to be explored on how mobile learning can develop and sustain literacy while creating further opportunities of voice and participation and better livelihoods.

In relation to project sustainability, most mobile phone enhanced literacy efforts were embedded as blended learning initiatives within existing non-formal literacy and community empowerment programmes contributing to a better alignment of learning objectives and efficient use of resources. Reviewed projects were set in place by local non-governmental organisations and international non-governmental organisations with a prevalent presence of external funding and little national public sector involvement. In addition, technological infrastructure remains limited in poor rural areas with family households struggling to afford a mobile phone device for each individual, mobile network subscriptions and related services. Furthermore, mobile phone devices in these communities often come with features in languages and scripts not relevant to the learner's needs.

Recommendations as derived from challenges and solutions encountered across the nine projects highlight key measures to improve and promote mobile phone enhanced literacy in the above contexts:

- Increase access and affordability of technological infrastructure, services and devices in rural communities;
- Promote women's mobile learning by building on existing socio-cultural norms and practices;
- Engage both female and male community stakeholders in project design and implementation;

- Create awareness on the extent to which the community, including teachers, can reproduce gender-biased roles and inequality in their daily lives and teaching practices;
- Build mobile-phone enhanced literacy components within existing literacy and empowerment endeavours;
- Encourage self and/or collective learning with skills and content relevant to the learners' prior knowledge, diverse needs and expectations;
- Link mobile phone enhanced literacy to collective efforts pursuing to improve women's livelihoods, voice, participation and employment opportunities;
- Motivate and engage teachers to develop and apply digital and literacy skills as part of cooperative, active and inquiry-based learning;
- Beyond illiterate and literate dichotomies, conceptualize and assess literacy and the use of information and knowledge as continuous learning enabling women to access further educational opportunities, better livelihoods and enhanced voice and participation in their communities.

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INTRODUCTION

The benefits and advantages of using mobile technology for learning in various educational settings are drawing high policy and research attention in the field of international development education. Much is discussed about the specific potential of mobile phone technology in reaching underserved communities, enhancing their learning and with this creating new opportunities to improve their living conditions. Can learning environments in poor rural areas be enhanced by mobile phone technology? More precisely, can mobile phones help improve literacy in ways that enable women and girls in these communities to access and benefit from greater voice, participation and decent work opportunities?

Based on the cross-analysis of nine mobile learning projects in three world regions, this report¹ seeks to understand the extent to which mobile phones enhance or develop literacy for women and girls in ways that contribute to their empowerment.

The education for the 21st Century agenda is defined in terms of equity, access and quality. In this context, advancements in Information and Communications Technologies (ICTs) are playing a paramount role in potentially expanding the educational opportunities for all. Literacy enables individuals to develop their own learning continuously in ways in which they can participate fully in their community and in a wider society. Given the powerful combination of ICTs and literacy, could they jointly enhance and advance gender equality? Can mobile phones be a part of a learning continuum that develops and sustains women's and girls' literacy – in formal learning environments, or in non-formal and informal ones? Ultimately, can mobile phones enhance women's and girls' learning in ways that strengthen their capability to choose and benefit from wider educational, social and decent work opportunities to improve their lives?

As societies change there is demand for new skills. Societies are becoming more interconnected through information and communication innovations along new and expanding political, economic and social configurations that cross national boundaries. 'Those without digital competences are increasingly excluded from many services and may face increasing difficulties managing their day-to-

1 This report is a result of the project 'Mobile Phone Literacy – Empowering Women and Girls' a partnership between the United States of America and UNESCO in 2011. The main goal of the project is to retain and improve the use of literacy skills of neo-literate women and girls through innovative mobile technology-based learning and information programmes.

day lives'.² Yet in response to social change, information and communication technologies can be used as tools to critically 'reflect, to evaluate, to program, to investigate and to transform' [society].³

This report is divided into four parts. **Part I** establishes a conceptual framework by examining definitions and the current status of three interrelated dimensions: literacy, mobile phone technology, and women's and girls' empowerment. Literacy – in its ample meanings and practices can transform mobile phone technology into quality mobile learning. This in turn can lead to varying degrees of empowerment for women and girls by increasing their voice, participation and employment opportunities. (A detailed examination of the different kinds and definitions of literacy can be found in Annex 2).

Part II introduces briefly methodological aspects related to the selection of nine mobile phone projects from three world regions and presents the framework for a comparative analysis.

Part III cross-examines the nine projects with particular attention to women. It presents trends and outcomes across the projects taking into account three main domains: project contexts and rationales; the mobile learning process; and project sustainability.

Part IV highlights the main challenges encountered in the projects and outlines solutions that some of the projects have used. It concludes by reviewing how outcomes and trends identified by the report have shed light on the main questions underlying the report.

2 UNESCO-UJIL 2013, pg.18.

3 Freire, P. 1997. *The Pedagogy of the Heart*. New York, Continuum, pg. 87.

KEY RECOMMENDATIONS

Ensuring affordable access to mobile phone technology

- Include in project budget planning the costs of providing mobile phone access to participants at no cost or at affordable prices negotiated with mobile sector providers, with no commercial strings attached.
- Consider community-based solutions to charge and repair mobile phones, for example using community-shared generators; solar-based mobile phone charging centres; communal repair centres.
- Use low-cost devices and rely on SMS-delivered content and interaction, which is more affordable than audio/voice features and is effective for retention of skills when practised continuously in relevant educational and livelihood contexts.
- Design projects that take advantage of the benefits of sharing mobile phones: lowers costs and encourages more cooperative and peer-to-peer learning.
- Create partnerships between private network providers and the state sector to provide access and promote the use of ICTs as development tools, especially in disadvantaged areas.

Promoting women's mobile learning by building on socio-cultural norms and practices

- Create awareness in communities of the benefits associated to mobile phone technology by promoting such use based on existing cultural values and behaviours.
- Engage the community, including male stakeholders, in project design and implementation.
- Design mobile learning content and interaction that is gender-sensitive and equitable.

- Engage female teachers as part of mobile learning initiatives, notably in remote rural areas, as a way to increase girls' participation.
- Enhance female and male teachers' awareness of the extent to which they can reproduce gender-biased roles or change them through their teaching practice.
- Aim for deeper structural change by raising social and political awareness of the causes and consequences of gender inequality.

Making mobile phone-delivered content and literacy skills relevant and applicable to needs and contexts

- Adapt mobile phone enhanced literacy (delivery mode, interaction and content) to the diverse needs of learners, including the provision of content in local and minority languages.
- Tailor the mobile learning process to women's and girls' socio-cultural and economic backgrounds, as well as their educational needs and expectations.
- Link mobile phone enhanced literacy to employment and rural livelihoods for women.
- Ensure mobile phones provide multi-language settings and diverse scripts where necessary.
- Provide reliable content that encourages critical thinking and interaction among learners.
- Make learning continuous and motivated by collective efforts that strengthen women's voice, participation and decent work opportunities in society;
- Base project blueprints on a participatory needs' assessment with the community's input. Identify particular educational needs of the learner as linked to relevant subsequent educational and livelihood opportunities.
- Engage with empowerment programmes in other development sectors (e.g. education and agriculture) to make the best use of segmented resources.
- Engage the public education sector in participating, aligning and sustaining mobile learning efforts within formal, non-formal and informal education settings.

Open mobile learning to a wide range of educational settings and pedagogical processes

- Use mobile phones as learning tools to enhance non-formal education and community empowerment settings, in ways that enable such blended learning opportunities to meet the needs of learners.
- Build on successful literacy initiatives, to use resources efficiently and for an appropriate alignment of content and skills.
- Integrate self-directed learning and collective learning strategies into pedagogical approaches.
- Encourage peer-to-peer learning, as this promotes social interdependence, collaboration and project sustainability.
- Encourage the appropriation by communities of the mobile learning process as part of a continuous and collective learning linked to a common good.
- Build on learners' existing knowledge and skills, including oral and visual literacy strategies.

Training educators as key participants in the learning process and in the community

- Select and train teachers from the community; this strengthens teacher-learner trust, reduces dropout and sustains projects within the community.
- Enhance teachers' literacy and train them in ICTs skills; make sure they support the importance of local language instruction and of making learning content and the pedagogical process relevant to learners' needs.
- Reinforce teachers with supportive liaisons (e.g. social mobilizers) within the community to give their work more impact at community level.
- Ensure girls have access to female teachers, who reinforce girls' trust to participate in mobile learning endeavours.
- Train teachers to use mobile phones as part of active guided pedagogies that go beyond the transmission and exchange of SMS messages.
- Train teachers to determine and tailor quality content in mobile learning process that can be linked to other on-going formal and non-formal educational measures.

Monitoring and evaluating how mobile phone learning can enhance women's and girls' literacy and empowerment

- Monitor and evaluate how mobile phone technology gains value depending on how it is used by individuals and their communities to enhance learning and skills that promote autonomy and increase possibilities for lifelong learning, voice and participation, and employment.
- Use qualitative methods in addition to quantitative ones to shed more light on how different factors affect project implementation and learning, including socio-cultural practices and structures.
- Assess all components of the mobile phone learning process according to literacy and empowerment objectives, with attention to content design, outcomes and pedagogy, including the active role of teachers.
- Measure literacy by going beyond “literate or illiterate” distinctions: literacy is not just a goal in itself, but also an on-going learning process of skills and practices through which people can improve their lives.
- Ensure that mobile phone-enhanced literacy in women is monitored beyond the acquirement of functional skills with these contributing also to wider domains of their human development.
- Explore the extent to which mobile phones, compared with other ICTs and other learning tools, can enhance learning processes at formal and non-formal levels of education, including a variety of interactions (such as face-to-face or mediated phone instruction).
- Use research and methodologically collected evidence to improve project design and implementation.



Part I:

Making Connections: Literacy, Mobile
Phones and Empowerment

The question addressed by this report has three main components: literacy - in its various conceptions and practices, mobile phone technology as part of quality learning, and women's empowerment in terms of human development. Part I looks at each of these in turn to examine conceptual approaches and definitions, as a way of laying the groundwork for the analysis in Part III.

Literacy

There is neither a common global understanding of literacy as a concept nor a single model that is appropriate to monitor it around the world.⁴ Conceptions and discussions of literacy are influenced by national contexts, including socio-cultural values and educational practices, as well as by global trends in international development agendas and research. However, most countries – not only at a policy level, but also in their day-to-day social interactions – still tend to use an either/or approach, referring to literacy in terms of whether people are literate or illiterate, whether they can or cannot read and write akin to literacy approaches of the 1950's.⁵

In parallel to this grounded reality of the understanding of literacy, this report also notes the prevalence of two main veins of thought on the concept: *theoretical conceptions derived from various academic fields*, which can be applied to the analysis of literacy from the level of individuals right up to its application in wider socio-economic, cultural and political spheres addressing to different extents literacy's potential to achieve equal, just and sustainable societies; and *global policy frameworks on literacy* agreed upon by the international community as represented by member states of international organizations such as the United Nations, including UNESCO and the United Nations Development Programme (UNDP).

In this report, theoretical and global approaches to literacy are integrated into three sets of understandings, which are used to examine the nine projects reviewed:

1. *Literacy as a set of autonomous/neutral skills*, including reading and writing, numeracy (or mathematical literacy) and digital skills.
2. *Literacy as applied skills*
3. *Literacy as a lifelong learning process for individual and social change*, including critical literacy.

4 UNESCO-UJL 2013 with reference to St. Clair, R. 2010.

5 The UNESCO *EFA Global Monitoring Report 2006: Literacy for Life* presents a comprehensive table on literacy definitions in 107 countries as determined by self-declaration and/or household declaration in household surveys or population censuses between 1996 and 2004.

The report also takes into consideration *oral and visual literacy*.

A fuller discussion of literacy conceptions and types of literacy can be found in Annex 2.

■ Literacy as a Set of Autonomous/Neutral⁶ Skills ⁷

Autonomous or neutral skills are deemed to be independent of social and individual backgrounds and contexts and are expected to be acquired by individuals along standard cognitive processes of learning. These are the so-called basic literacy skills – reading and writing, and numeracy – as well as digital skills.

The approach to literacy as an autonomous/neutral set of skills is akin to how literacy is currently measured at a global level with methods including population censuses and household surveys⁸ as well as tests of achievement at varying levels. The first two have the caveat that respondents tend to overstate their literacy level and the latter implies that individual skills be measured in a large or broad enough population sample. In these measurements, following the UNESCO resolution of 1958, literacy is defined as the ability to both read and write, with understanding a simple statement related to one's everyday life.

At the time of UNESCO's 1958 definition, post-Second World War universal and national literacy efforts aimed to eradicate illiteracy in hand with the promotion of basic education. However, successful literacy campaigns, such as Cuba's in 1961 remain rare.⁹ The International Conference on Adult Education, held in Montreal in 1960, stated aims that were still echoed forty years later in the Education for All (EFA) goals and Millennium Development Goals (MDGs) of 2000: 'to eradicate illiteracy in just a few years that would bolster isolated national efforts in developing countries, with the financial support of industrialized countries'.¹⁰

6 In Paulo Freire's terms: a separation between text and context; reading the word vs. reading the world.

7 Drawing partially from the conceptual organization presented in Chapter 6, *Understandings of Literacy in the UNESCO, 2005a, EFA Global Monitoring Report 2006. Literacy for Life*. Paris, UNESCO.

8 The UNESCO Institute of Statistics collects literacy data worldwide in this way along a literacy definition of 1958; we refer to these measurements in order to address the status of literacy at a global level.

9 Arnove, R. and Graff, H. (eds). 1987. *National Literacy Campaigns: Historical and Comparative Perspectives*. New York, Plenum Press.

10 UNESCO, 2005a, pg. 153.

BOX 1: Mapping women and girls' literacy around the world

Girls' literacy levels are not measured directly; they can be estimated by looking at how many girls are out of school. Girls made up about 54% of the global population of 57 million children who were out of school in 2011. Overall, girls continue to face high barriers to schooling in Northern Africa, sub-Saharan Africa and Western Asia. Eastern Asia is the only developing region where girls have greater access to primary school than boys.

In the Arab States the share of girls out of school remained unchanged since 1999 at 60%. In South and West Asia, by contrast, the share of girls in the out-of-school population fell steadily from 64% in 1999 to 57% in 2011. Nevertheless, South and West Asia has four of the ten countries with the highest gender disparities globally: Afghanistan, Pakistan, Bangladesh and Nepal. Although more girls are now in school in sub-Saharan Africa, only 93 girls are enrolled in primary school for every 100 boys.¹¹

Literacy levels among young people and adults have improved around the world over the past two decades. Literacy rates for those aged 15 to 24 were higher than adult literacy rates in all regions in 2011, possibly reflecting increased access to primary and secondary education among younger generations. In some regions, young women are improving their literacy faster than their male counterparts.¹²

The literacy rate for youth (aged 15 to 24) increased by 6 percentage points between 1990 and 2011. As a result, 89.5% of young people globally have basic reading and writing skills (92.2% male and 86.8% female). Yet 123 million young people are still unable to read or write; 61 per cent of them are young women. The literacy rate among young women is growing at a faster pace than that of young men: In Northern Africa, the female literacy rate rose 28 percentage points from 1990 to 2011, compared with 16 percentage points for young men. In Southern Asia, the literacy rate grew by 26 percentage points for young women and by 17 percentage points for young men, over the same period. All regions are moving closer to the point at which male and female literacy rates will be equal.¹³

The adult literacy rate, for the population 15 years and older, was 84.1% globally in 2011 (88.6% male and 79.9% female), an increase of 8 percentage points since 1990.

Two regions were at or near universal literacy: Central and Eastern Europe (adult literacy rate 99%) and Central Asia (100%), respectively. In East Asia and the Pacific (95%) and Latin America and the Caribbean (92%) at least nine out of ten adults were able to read and write. The average for Latin America and the Caribbean conceals lower literacy rates in the Caribbean, however, where the adult literacy rate was only 69% in 2011. Adult literacy rates were also below the global average in South and West Asia (63%) and sub-Saharan Africa (59%); in these two regions more than one third of adults could not read and write.

Since 1990, the literacy rate among adult women has risen by 10 percentage points versus 7 percentage points for men.

In all regions with data, except Central Asia, female literacy rates were lower than male literacy rates. The gap was especially large in the Arab States (male 85%, female 68%), South and West Asia (male 74%, female 52%), and sub-Saharan Africa (male 68%, female 51%).

11 UNESCO, 2014.

12 Reporting on literacy rates and the illiterate population at regional and global levels, the UNESCO Institute for Statistics (UIS) collected data on adult and youth literacy in 151 countries and territories from seven regions: Arab States, Central Asia, Central and Eastern Europe, East Asia and the Pacific, Latin America and the Caribbean, North America and Western Europe, South and West Asia, and sub-Saharan Africa. The most recent literacy rates and estimates of the illiterate population to date come from 2011.

13 UN 2013, pg.17 and UIS Information Paper June 2013 - Adult and Youth Literacy National, Regional and Global trends, 1985-2015.

Women still represent two thirds of illiterate adults worldwide¹⁴ as in 2011, 774 million adults were unable to read and write; 63.8 per cent of these were women. The female share of the illiterate population was greatest in Central and Eastern Europe (78%), East Asia and the Pacific (71%), the Arab States (66%), and South and West Asia (64%). In the other regions, the female share of the regional illiterate population was below the global average: Central Asia (63%), sub-Saharan Africa (61%), and Latin America and the Caribbean (55%).

■ Literacy as Applied Skills¹⁵

The practical application of basic literacy skills was conceptualized in the 1960s and 1970s as 'functional literacy'. This concept initially emphasized the impact of literacy on labour and economic growth. Views of functional literacy often assumed literacy could be taught as a universal set of standard skills (applicable everywhere and learned in the same way). Literacy was seen as neutral and independent of social context.

Influenced by human capital models supporting literacy as a necessary condition for economic growth, UNESCO's General Conference in 1978 recommended a definition of functional literacy that included community development: 'a person is functionally literate who can engage in all those activities in which literacy is required for effective function of his or her group and community and also for enabling him or her to continue to use reading, writing and calculation for his or her own and the community's development'.¹⁶

■ Literacy as a Lifelong Learning Process for Individual and Social Change

Building on understandings of functional literacy as implying the application of skills not only in economic but also socio-cultural contexts, others go further to situate literacy as a lifelong learning process combined with a critical theory perspective. Literacy can encompass autonomous/neutral skills, functionally applied in context, yet can also be taken forward from a local/individual learning experience to include participation in wider economic, social, cultural and political spheres.¹⁷ Literacy is inherent to a continuum of learning in connection to society and a human right essential for lifelong learning and social change.

In this wider approach, literacy goes beyond the application of an 'autonomous' technical skill to gain meaning as an individual action of social practice embedded in social settings 'contextualizing the event in the power structures and cultural meanings at play'.¹⁸ For example, literacy learning implies a dynamic of new

14 UN, 2013.

15 Drawing partially from the conceptual organization – first two understandings of literacy - presented in Chapter 6, *Understandings of Literacy in the UNESCO EFA Global Monitoring Report 2006. Literacy for Life*.

16 UNESCO, 2005a, pg.154.

17 See Torres, C.A. and Arnove, R.F. 2007. (eds.) *Comparative Education: The Dialectic of the Global and the Local*. Third Edition. Maryland: Rowman & Littlefield Publishers.

18 Quoted as Quoted as Street, B., 1993, pg. 7 in Barlett, L. 2003, pg. 70.

identities being formed alongside new social practices, including those of participation as part of a community. In this regard, the New Literacy Studies (NLS) emerged as an interdisciplinary field studying language, learning and literacy in an integrated way in the full range of their cognitive, social and cultural contexts.¹⁹

As supported by the 1996 Report of the International Commission on Education for the Twenty-First Century, and the 1997 Hamburg Declaration: 'Literacy, broadly conceived as the basic knowledge and skills needed by all in a rapidly changing world, is a fundamental human right. (...) There are millions, the majority of whom are women, who lack opportunities to learn or who have insufficient skills to be able to assert this right. The challenge is to enable them to do so. This will often imply the creation of preconditions for learning through awareness raising and empowerment. Literacy is also a catalyst for participation in social, cultural, political and economic activities, and for learning throughout life'.²⁰

Critical literacy

Tightly linked with critical pedagogy²¹, critical literacy is understood as the extent to which literacy empowers learners to bring about change within the 'problematics of power, agency and history'.^{22 23} As Paulo Freire, who envisioned a 'world that is more round, less ugly, and more just' remarked in relation to the proposal of a literacy programme: 'We wanted a literacy programme which would be an introduction to the democratization of culture, a programme with men and women as its subjects rather than as patient recipients, a programme which itself would be an act of creation, capable of releasing other creative acts, one in which students would develop the impatience and vivacity which characterize search and invention'.²⁴

■ Oral and Visual Literacies

'There should be no doubt that every population of this world has the same capacity for logical reasoning. The old argument that illiterate groups have a less logical way of reasoning has been invalidated'.²⁵

Oral literacy

Anthropological and developmental studies have enriched the understanding of literacy as connected to oral culture. Oral language transports logical information

19 See Gee, J.P., 1990, Barton, D., 1994, Barton and Hamilton, 1998, Street, B. 1988.

20 UNESCO, 1997.

21 Freire, P., 1996.

22 Macedo, D. (with reference to Henry Giroux) in Introduction – Freire, P. 1996, pg. 17.

23 See Giroux, H. A. 1988. *Teachers as intellectuals: toward a critical pedagogy of learning*. Granby, Massachusetts, Bergin & Garvey.

24 Freire, P. 'Education for Critical Consciousness/Education and Concientizacáo' in Araujo Freire, A.M. and Macedo, D. 2000 (eds.) *The Paulo Freire Reader*. New York, The Continuum International Publishing Group, pg. 82.

25 Elwert, G. 'Societal Literature: Writing Culture and Development' quoting Elwert and Sehoueto, 1999; Scribner and Cole, 1981; and Triebel, 1997 in Olson, D. and Torrance, N. 2001. *The Making of Literate Societies*. Malden, Mass, Blackwell, pg. 61.

through means of dialogue. Literacy as written language is built upon a strong oral tradition and thrives only if a living oral culture sustains it.²⁶ Oral face-to-face communication has a variety of ways to express meaning. The outcomes of both literacy and orality depend on social context, with all three being interlinked.²⁷

Visual literacy

Visual literacy emphasizes the observation that people 'learn to read pictures just as they learn to read the pages in a book'²⁸. In this regard, "reading" may mean not only the decoding and understanding of words, but also the interpreting of signs, symbols, pictures and sounds, which vary by social context.

BOX 2: Global commitments: literacy as lifelong learning in an information and knowledge society

Human development serves as a basis for international efforts geared to improve the well-being of individuals as active participants and beneficiaries of just and equal societies. The potential of ICTs in developing literacy for such goals is supported by global frameworks envisioned to improve the education and lives of those in most need, especially of girls and women.

Literacy as a right and a basis for lifelong educational opportunities gains support with the 1997 Hamburg Declaration on Adult Learning²⁹, the World Declaration on Education for All (EFA)³⁰ in Dakar, and the subsequent UN Decade for Literacy³¹ launched in 2003, as well as with the Belém Framework for Action in 2009:³² 'literacy is the most significant foundation upon which to build comprehensive, inclusive and integrated lifelong and life-wide learning for all young people and adults'.

Alongside the EFA goals and the Millennium Development Goals, which underline the importance of equal access to quality education for all, lifelong learning brings together all forms of education, based on inclusive, emancipatory, humanistic and democratic values in a knowledge-based society.³³ Such a notion of learning and society was corroborated in 2003 by the World Summit on the Information Society its Declaration of Principles, which aimed 'to build a people-centred, inclusive and development-oriented information society'. In this kind of society, 'everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life'.³⁴

26 Olson, D. and Torrance, N. 2001, pg.6.

27 See Adams, M. J. 1994. *Beginning to read: learning to about print*. Cambridge, MA, MIT Press; Gee, J.P. 2004. *Situated language and Learning: A Critique of traditional Schooling*. London, Routledge. Greensbacker, M.A., Varner, K.R., and Faust, M. 1990 'Investigating differences in general comprehension skill'. *Journal of Experimental Psychology: Learning, Memory and Cognition* 16, pp. 430-45.

28 UNESCO, 2005a.

29 UNESCO, 1997.

30 UNESCO, 2000.

31 This Decade is supported by the UNESCO's Literacy Initiative for Empowerment (LIFE) as an implementation framework targeting countries that have an adult literacy rate of less than 50 % or a population of more than 10 million people who cannot read nor write.

32 Sixth International Conference on Adult Education (CONFINTEA VI) - UNESCO-UIL, 2010.

33 UNESCO-UIL, 2010.

34 World Summit on the Information Society, *Declaration of Principles. Building the Information Society: a global challenge in the new Millennium*, Document WSIS-03/GENEVA/DOC/4-E (12 December 2003).

The Declaration of Principles notes how technology can exacerbate inequality yet also counteract it: ‘the benefits of the information technology revolution are today unevenly distributed between the developed and developing countries and within societies. We are fully committed to turning this digital divide into a digital opportunity for all, particularly for those who risk being left behind and being further marginalized’.³⁵ Going further, the Declaration of Principles specifies the vulnerable groups being left behind, including migrants, displaced people and refugees, the unemployed, minorities and nomadic people, the elderly and people with disabilities.

The Declaration of Broadband Inclusion for All was presented by the members of the Broadband Commission to world leaders attending the 2010 Millennium Development Goals Summit of the UN. The Declaration highlights the innovative and strategic importance of broadband internet access and ICTs in providing effective and sustainable solutions to the global challenges of eradicating poverty, promoting health, advancing gender equality and ensuring quality education for all’.³⁶ The Broadband Commission also focused on the link between content and ICTs that the current report underlines: ‘Connectivity without content can make even the most sophisticated technologies irrelevant or of limited value’.³⁷

ICTs and Mobile Phones as Part of Development

The potential of ICTs to enhance international development goals – including the Millennium Development Goals³⁸ – has gained considerable support. Along those lines, the World Bank, UNDP and development agencies identify ICTs as having beneficial applications in rural development projects that ‘seek to stabilize communities, expand women’s roles, and mitigate social and environmental inequities’.³⁹ In fact, the sum of telephone lines and mobile subscribers, expressed per 100 people is now considered by UNDP as a development indicator.⁴⁰

Mobile phones have been shown to help improve social links, create social capital, and increase market information flows, productivity, gross domestic product (GDP) and foreign direct investment (FDI).⁴¹

Among reviewed positive examples of the application of mobile phone technology in international development:⁴²

- In agriculture, ICTs including mobile services are providing farmers with localized market information and agricultural information,⁴³ as well as

35 Ibid, Article 10.

36 ITU-UNESCO, 2013b, pg. 2.

37 ITU-UNESCO, 2010, pg. 31.

38 See World Summit on the Information Society, Declaration of Principles, November 2005; Kaur, H., & Tao, X. (eds.) 2013; Siriginidi, S.R. 2009 as quoted in Dodson, L. 2014.

39 See Dodson, L. 2014 with reference to GSMA, 2008; Hamel, J-Y. 2010; UNCTAD. 2010; UNCTAD. 2011; Zhen-Wei Qiang, C., Clarke, G.R., & Halewood, N. 2006.

40 Human Development Report Office calculations based on data on cellular subscribers and telephone lines from ITU, 2012 and population data from the UNDESA 2011.

41 GSMA, 2008.

42 See World Bank, 2012 and GSMA, 2012.

43 Gakuru, M. & Stepman, F. 2009.

information on weather and climate, pest control, cultivation practices and agricultural extension services.

- In health care, mobile phones use software applications that help deliver health services, as well as simpler features such as text messages to send drug reminders to HIV/AIDS patients.
- In disaster⁴⁴ and climate change⁴⁵ situations, mobiles can help to disseminate information rapidly, preparing vulnerable populations to face impending threats.

In other domains, the impact of mobile phones on development has brought more sceptical or critical reviews. In the case of 'm-finance' – the use of mobile phones for money transfers and banking – 'the financial needs of poor communities have not been sufficiently taken into account. This may be because m-finance initiatives tend to be commercially driven by the mobile phone industry as a value-added service designed to expand market share and generate revenue.'⁴⁶

■ The Scope and Reach of the Mobile Phone Sector: Beyond Access

The reach of mobile phone technology as a tool to enhance learning, including literacy projects, is generally addressed in terms of technology and communication services: access, connectivity, mobile services and subscriptions, mobile phone ownership and affordability. Sex-disaggregated data regarding the above helps to understand up to a certain point, the extent to which there is a gender digital divide in accessing and using mobile phone technology. Though it is useful to know how, where and whom mobile phone technology is reaching, it is important to interpret such statistics in light of human development purposes and critically beyond marketing studies of the mobile sector.

Asia is the region where most initiatives by mobile network operators in developing countries have been rolled out.⁴⁷ Of the total initiatives in Asia, mobile learning programmes that focus on literacy and language learning constitute the largest portion. In Africa, by contrast, 50% of mobile learning initiatives focus on health-education issues.⁴⁸

It is more difficult to know how women have been using mobile phones. In general, four barriers have been identified that limit technology adoption by women: their exclusion from technology education; their lack of free time; social norms that

44 GSMA, 2013.

45 Ospina, A.V., and Heeks, R. 2012.

46 Duncombe, R. and Boateng, R. 2009.

47 GSMA, 2010.

48 UNESCO, 2013f.

favour men; and financial and institutional constraints.⁴⁹ Research that explores near-universal barriers to women's ICT access and use in developing countries show limitations of time, cost, literacy levels, safety and perceived relevance of technology to women's lives.⁵⁰ In trying to understand the socio-economic and cultural factors underlying the gender divide, some recommend that ICT efforts be gender-aware in order to realize their development potential.⁵¹

Overall, 'the discussion about women's access to and use of digital ICTs in developing countries has been inconclusive so far.⁵² However, an extensive empirical study covering 12 Latin American and 13 African countries from 2005 to 2008 'showed that fewer women access and use ICTs because they have less access to employment, education and income – but when controlling for these variables, women turn out to be more active users of digital tools than men.

This turns the alleged gender digital divide into an opportunity: given women's affinity for ICTs that can improve living conditions, ICTs represent a concrete opportunity to tackle longstanding gender inequalities in developing countries, including access to employment, income, education and health services'.⁵³

A good understanding of how mobile phones can be used to aid learning has remained elusive, however.⁵⁴ Most attempts addressing gender and technology focus primarily on the latter without much connection to the former. Similarly, there has been little attention to how mobile phones are used within the household economy or how they are implicated in power relations within households and societies.⁵⁵ It is known that users with low literacy skills have difficulties with text-based user interfaces. Other difficulties involve 'issues related to contexts of use, such as 'cognitive difficulties, collaboration, cultural etiquette, experience and exposure, intimidation, mediation, motivation, pricing, power relations and social standing'.⁵⁶

■ The Process of Mobile Learning

Mobile phone technology and learning imply a tool and an educational process or learning experience. Combined they are contained within a definition of educational technology as the 'ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources'.⁵⁷

49 See Gill, K., Brooks, K., McDougall, J., Patel, P. and Kes, A. 2010 as referenced in Dodson, L.; Sterling, R. and Bennett, J.K., 2013.

50 Hafkin, N., 2000.

51 Primo, N., 2003.

52 Martin, H., 2011.

53 ibid

54 Balasubramanian, K., P. Thamizoli, Umar, A. & Kanwar, A. 2010, pg. 196.

55 See for domestication of technology framework - Silverstone, R., Hirsch, E., & Morley, D. 1992. Information and communication technologies and the moral economy of the household. In R. Silverstone and E. Hirsch (eds.), *Consuming technologies: Media and information in domestic spaces* (pp. 15–31). London, Routledge.

56 Medhi, I., Cuttrel, E., and Toyama, K. 2010, quoted in Dodson, L., et al. 2013, pg. 81.

57 Januszewski, A., and Molenda, M., 2008.

The Mobile Phone as a Tool

In the context of international development education projects, mobile phones are increasingly being used in various formal, non-formal and informal learning contexts by disadvantaged communities with the aim of improving their lives. In addition to enhancing learning, mobile phones can help people access other tools, resources and information, enabling them to participate more actively in their communities and at national and even global level. A variety of mobile phones can be used in ICT development projects, each involving different costs, access and operability.

Aside oral communication, mobile phones support many services that rely on literacy skills, including basic text messaging via SMS (Short Message Service); multimedia messaging service (MMS); email; Internet access; and a wide range of applications and software, especially on feature or smartphones that support multimedia, memory cards, offline use in the absence of cellular connectivity, and programmability by third-party software developers. Feature phones are more sophisticated than basic mobile phones that only support voice telephone calls and text messaging. Mobile phones can be owned and controlled by an individual or a group of individuals or an organization, association or institution.

Other ICT resources commonly used for mobile phone learning in development contexts include laptops with management software or systems that allow for bulk SMS aggregation and distribution; they can be accompanied by web-based platforms that follow or allow for interaction of messaging (e.g. bulk SMS, interactive SMS services, SMS-based crowdsourcing, and SMS-based data collection to reach beneficiaries).

Beyond Learning Being Mobile: Quality Learning

The term mobile learning is commonly used 'for the use of mobile technology, either alone or in combination with other ICTs, to enable learning anytime and anywhere. People can use mobile devices to access educational resources, connect with others, or create content, both inside and outside classrooms'.⁵⁸

Yet beyond learning being mobile, what is really meant by learning being enabled by mobile phone technology? What kind of content or knowledge is being created and recreated by those using mobile phones for educational and livelihood purposes? Is such learning of good quality? And what kind of teaching, guidance or facilitation mediates such learning?

With literacy involving learning processes based on theories supportive of active, cooperative and problem-based/inquiry based learning, learning and teaching with

58 UNESCO, 2013d, pg.6.

mobile devices can go beyond traditional rote memorization and the transmission of information.

Mobile learning can encourage learners to:

- develop their cognitive abilities, such as critical reasoning, vis-à-vis an issue or an experience at stake engaging with their environment in new ways;⁵⁹
- critically identify, select and process information exchanged via mobile phones that applies to real-life situations or problems;
- actively learn in ways that enhance their knowledge, skills, attitudes and behaviours, opening wider education, social and economic opportunities through which they will be able to help make their societies more equal, just and sustainable;
- learn individually, yet also collectively and critically, learning to question in interaction with others.

Mobiles favour group learning

Cooperative or collaborative learning⁶⁰ can be encouraged by sharing mobile phones or other ICTs, especially when it is not feasible to provide one device per individual. Sharing mobile devices can create a positive interdependence among learners working as a group, including within households or as part of community groups. Cooperative learning can counteract competitive and individualistic approaches: 'Students must believe that they are linked with others in a way that one cannot succeed unless the other members of the group succeed and vice versa. Students must perceive that they sink or swim together'.⁶¹

Mobile phone technology can help learners interact with their peers in addressing common problems that allow them to practice and sustain their literacy skills. Groups of learners, such as those composed of women or girls, can retain such skills by collectively creating shared knowledge specific to a problem or local context with which they can identify.

Teachers and peers as facilitators

'[To teach] is not to transfer knowledge, but to create the possibilities for its own production or construction'.⁶²

Teachers and peers – including friends and family members – can help and motivate mobile learners advance in their digital use of mobile phones and in their literacy levels. Learners are able to progress to higher levels of thinking under

59 'The principal idea behind problem-based learning is that the starting point of learning should be a problem, a query or a puzzle that the learners wishes to solve' in Boud, D. & Feletti, G.I. 1997. *The Challenge of Problem-Based Learning*. London, Kogan Page, p.1.

60 Johnson, D., and Johnson, R., 1989.

61 Smith, K.; Sheri D., Sheppard; Johnson, D.W.; and Johnson, R.T. 2005, p. 8.

62 Freire, P., 1996.

teacher guidance and in dialogue with their peers - a process sometimes known as 'scaffolding'. Scaffolding⁶³ brings forth the student's prior knowledge, skills and experiences to establish associations with new concepts and problem-solving.

Tailoring mobile learning to gender needs

Mobile learning strategies can be tailored differently for boys and girls, and for young women and men, who present not only an unequal educational performance but also different socio-economic and cultural backgrounds. Gender equality does not mean that all girls and boys learn the same way but emphasizes that both have the right to the same educational opportunity. Gender equity calls for differentiation in the learning process so boys and girls can make the best of any educational opportunity.

Teachers using mobile learning can compensate for gender differences in learning processes and outcomes by recognizing, affirming and building on female and male abilities, skills and performance.

As a representation of culture, gender is constructed through social processes that give a certain value to what it means to be female or male in society. Teachers, learners and their communities partake in the socialization process by which boys and girls acquire and learn values, attitudes and beliefs on gender. It is thus important for them to learn how to reconstruct in their daily lives the values and practices defining gender in their societies.

Adapting mobiles to learning contexts - including rural areas

Mobile phone technology can be well suited to literacy programmes that aim to be relevant to learners' needs, leading to 'functional and sustainable knowledge, skills and competence of participants empowering them to continue as lifelong learners whose achievement is recognized through appropriate assessment methods and instruments'.⁶⁴

Some propose, for example, to combine literacy projects with income-generating or livelihood activities. This may attract more interest and motivation from women and girls, and ultimately empower them to participate more actively in economic and social activities.⁶⁵ Taking into account rural contexts, others propose to tailor learning content to the technical knowledge required in agriculture or to vocational training for women.⁶⁶

The flexibility of mobile phone technology enables it to be used in formal as well as non-formal learning settings, with various forms of delivery (real-time or delayed). This means it can be adapted to time and geographical limitations of different

63 Vygotsky, L.S., 1964.

64 UNESCO, 2005a, pg.8.

65 See Kotsapas, A., 2011, Robinson-Pant, A., 2004 and Stromquist, N. P., 2009.

66 FAO, IFAD, ILO, 2010.

communities, including nomadic populations. In each context, mobiles can also make possible 'blended learning', with various combinations of face-to-face learning and mobile mediated instruction.

The flexibility and quality of mobile learning means it can respond to socio-economic and cultural features of communities, both rural and urban. Most projects reviewed in this report were implemented in rural communities. Schools are often scant in rural areas, and access to them problematic, with the distance between home and school posing problems especially for girls and female teachers. Non-formal education alternatives in rural areas can include services or spaces provided by health entities or religious groups, as well as indigenous and traditional learning provided in family and community environments. In rural areas, women and girls tend to work in low-paid agricultural jobs or to carry out household chores.

Mobile phone literacy projects whose content takes into account such contextual factors related to learners' livelihoods can have a greater impact on the learning opportunities of rural populations, especially of girls and women.

Women's and Girls' Empowerment as Human Development

To understand how mobile phones and literacy can together empower women and girls, it is important to define what empowerment means. Empowerment in this report is understood as expanding women's and girls' educational, social and employment opportunities. Empowerment is an outcome yet part of the process that enlarges women and girls' capability to do and to be and thus to define the kind of life they would like to lead. People's capabilities, as freedom, include the opportunity to do and to be what they have reason to value.⁶⁷

Empowerment is a sustained process of human development defined as 'enlarg[ing] people's choices. The most critical of these are to live a long and healthy life, to be educated and to have access to resources needed for a decent standard of living. Additional choices include political freedom, guaranteed human rights and personal self-respect'.⁶⁸

67 'The notion of capability is essentially one of freedom – the range of options a person has in deciding what kind of life to lead. Poverty, in this view, lies not merely in the impoverished state in which a person may actually live, but also in the lack of real opportunity – imposed by social constraints as well as personal circumstances – to choose other types of living' In Sen, A. 2003. *A Matter of Choice*. In the UNESCO Courier, Special Issue November 2003, pg. 33.

68 UNDP, 1990, pg. 9-10.

In relation to the Millennium Development Goals (MDGs)⁶⁹, progress has been made since 2000 in halving the number of people living in extreme poverty and the proportion of people without sustainable access to improved sources of drinking water. The proportion of urban slum dwellers has also declined significantly. Gains have been made in the fight against malaria and tuberculosis. There have been visible improvements in all health areas as well as in primary education.⁷⁰ However, members of the poorest families and especially women and girls and those living in rural areas, continue to encounter obstacles in accessing education opportunities. This is compounded to rural communities being the worst off in development terms including access to basic health services and drinking water (83 % of the population that has no access to an improved drinking water source lives in rural communities).⁷¹

■ Education and the Need to Overcome Discrimination

It is well documented that women are discriminated against in health, education and in the labor market, which results in a restriction of their freedoms. The extent of discrimination has been measured through the Gender Inequality Index (GII), which demonstrates the loss of achievement due to gender inequality in reproductive health, empowerment and labour market participation. The higher the GI value, the greater the discrimination.

Overall, between 2000 and 2012, progress in reducing the GI value has been almost universal, but uneven⁷². In general, high gender disparities persist in South Asia (0.568), sub-Saharan Africa (0.577) and the Arab States (0.555).

Sub-Saharan Africa shows the highest gender disparities of all regions, despite improvement in the GI value between 2000 and 2012, mainly because of higher maternal mortality ratios and adolescent fertility rates, and considerable gaps in educational attainment.⁷³ In South Asia, GI values are kept high by low female representation in parliament⁷⁴ (18.5%), gender imbalances in educational achievement (28% of women have completed at least secondary education, compared with 50% of men) and low labour force participation (31% of women are in the labour force, compared with 81% of men).

69 United Nations General Assembly, 55th Session, A/RES/55/2, - United Nations Millennium Declaration, September 18, 2000.

70 UN, 2013.

71 *ibid*

72 *Ibid*, pg. 36.

73 UNDP, 2013, pg. 31.

74 High development group countries can still show considerable gender gaps in parliamentary representation.

■ How Education Empowers Women

Gender equality⁷⁵ and equity⁷⁶ lead to and yet are also an outcome of empowerment and human development. Similarly, education is in itself a human right, yet it is also part of the core process leading to human development.

Education can increase women's choices in all three main dimensions measured by the GII. Improving education for women helps raise their levels of health and nutrition, and reduces fertility rates.⁷⁷ Education increases 'people's self-confidence and enables them to find better jobs, engage in public debate and make demands on government for health care, social security and other entitlements'⁷⁸. In particular, education empowers women to make choices that improve their own and their children's health and chances of survival.⁷⁹ Education helps prevent and contain disease, and is an essential element of efforts to reduce malnutrition. Further, education empowers women to make choices that improve their welfare, including marrying later and having fewer children.⁸⁰ Crucially, education also increases women's awareness of their human rights and their confidence to assert those rights.

This report concentrates on two aspects of women's empowerment enabled by education: their voice and participation, and their employment opportunities.

■ Increasing Women's Voice and Participation

Empowerment implies having an enabling voice and participation in society.⁸¹ 'Unless people can participate meaningfully in the events and processes that shape their lives, human development paths will be neither desirable nor sustainable. People and women should be able to influence policymaking and results – and young people should be able to look forward to greater economic opportunities and political participation and accountability'.⁸² Education informs and can do so critically, and thus empowers informed decision-making. Education can promote informed civic participation, thus contributing to democracy and good governance especially in contexts that encourage wide political opportunities and a strong civil society. But gender-based inequalities in decision-making power persist, in

75 Gender Equality: Different behaviour, aspirations and needs of women and men are considered, valued and favoured equally. Rights, responsibilities and opportunities will not depend on whether they are born male or female – ILO. 2000. *ABC of Women Worker's Rights And Gender Equality*, Geneva, International Labour Organization, pg.48.

76 Ibid, pg. 48: Fairness of treatment for women and men, according to their respective needs. [treatment can be] different but [e]quivalent in terms of rights, benefits, obligations and opportunities.

77 UNDP, 2013, pg. 33.

78 Ibid

79 See UNESCO, 2014 and UNDP, 2013.

80 See UNESCO, 2014.

81 Unfortunately, the Gender Inequality Index, despite making reference to empowerment which can be associated to voice and participation, does so only in terms of national parliamentary representation without including participation at the local government level and elsewhere in community and public life.

82 UNDP, 2013, pg.6.

the public and private spheres, from the highest levels of government decision-making to households. Women continue to be denied equal opportunity with men to participate in decisions that affect their lives.⁸³

■ Creating Employment, Reducing Poverty

Education offers a key path to reducing poverty for women by increasing their opportunities for employment that is secure and that provides good working conditions, including social protection and decent pay. 'Education enables women in paid formal jobs to earn higher wages, and offers better livelihoods for those in rural areas. It is not just time in school, but skills acquired that count. Improved literacy can give a particularly strong effect on women's earnings, suggesting that investing in women's education can pay dividends'.⁸⁴

The need to tap the power of education for women – including the opportunities that might be supported by mobile learning – is underlined by the gender gap that still persists with women at a disadvantage regarding their achievement of full and productive employment and decent work. There was a 24.8 percentage point difference between men and women in the employment-to-population ratio in 2012. The gap was most acute in Northern Africa, Southern Asia and Western Asia, where women are far less likely to be employed than their male counterparts. The differences in the employment-to-population ratio between men and women in these three regions approached 50 percentage points in 2012'.⁸⁵ Overall, in most regions, rural women seem more likely than rural men to be engaged in self-employment (and thus less likely to be wage earners). At the same time, much of women's work in rural areas is informal or unpaid and thus still goes unrecorded.⁸⁶

83 UN, 2013, pg.23.

84 UNESCO, 2014, pg. 17; see also UNDP, 2013.

85 UN, 2013, pg. 9.

86 FAO, IFAD, ILO. 2010, pg. 3-4.



Part II:

Methodological
and Analytical Aspects

This section refers to methodological aspects related to the selection of projects cross-examined by the report and presents most importantly the analytical framework for such comparative analysis.

Selection of Projects

The projects were selected⁸⁷ taking into account female literacy levels as well as primary school enrolment, paying special attention to countries or communities with the greatest need in literacy and universal primary education and the least gender equality. Three of the projects took place in sub-Saharan Africa, five in Asia and one in the Arab States (see Annex 1 for project details).

Selection of the nine projects required that collected sources examining them documented how mobile phones were used in project implementation activities. This meant reporting how mobile phones were used in learning or development processes meant to improve the literacy levels of women and girls at formal or non-formal levels of education. Selection of project sources sought to keep as a basic requirement that these had advanced from initial design to piloting or implementation stages. All had monitoring/evaluation mechanisms followed to varying degrees by documented results in the sources collected for this analysis.

This report's analysis relies on the validity of data and methods presented in these secondary sources including project-related reports, peer-reviewed publications and conference proceedings. Such sources address questions that may not coincide exactly with this report's main underlying question of whether mobile phones can be used to improve literacy levels in ways that empower girls and women.

Analytical Framework

The cross-case analysis in this report focuses on three main features of the projects reviewed: their social, economic and cultural contexts, and their associated

87 The majority of the projects were identified via commissioned regional reviews that conducted desk research via web search engines and academic databases broadly using terms such as 'female literacy,' 'empowerment,' 'mobile learning' and 'mobile phones' to identify mobile learning initiatives relevant to the review. Such searches looked for cases of mobile phone-based literacy and skills development programmes with focus on women and girls yet as well on a general population with women implicitly involved. Project case studies and regional consultation meetings also supported the regional reviews with experts in mobile learning, literacy development and gender equality.

literacy and empowerment rationales; the ways they used mobile phones to improve literacy; and their sustainability.

Contexts and rationales: An examination and comparison of the nine projects' socio-economic and cultural contexts opens the way to identifying the projects' rationales and linking them to their contexts. The report takes into account each project's purpose and its focus on the needs of a particular population. The analysis also examines how each project considers literacy and how it benefits women and girls by improving their voice, participation, livelihood and work opportunities.

Mobile learning: The report looks at how mobile phones were obtained and used as a key tool – including technical and language features – to enhance new or existing literacy efforts and/or livelihoods. The analysis distinguishes between non-formal and formal learning environments. It examines the pedagogical approaches and learning processes that mobile phones supported, including how content was delivered (including whether it was real-time or asynchronous), and how teachers or trainers participated. The kind and relevance of content delivered, exchanged and interacted upon and the language of instruction are analysed. Socio-cultural interactions surrounding the access and use of mobile phones as part of learning and communication processes are examined, with a special emphasis on gender relations. How projects monitored and evaluated their impact is examined, with attention to reported outcomes.

Sustainability: In order to gauge whether projects are sustainable and whether they can be scaled up, the report highlights the extent and kind of resources that projects could count on, including: technological infrastructure; the use of mobile phones as tools vis-à-vis other ICTs and other resources; and human resources, notably trainers. The report examines how projects' design and implementation involved partnerships with external entities, key national and local stakeholders, and public and private funding mechanisms. The report looks at the extent to which projects engaged with their target communities in participatory assessments and how this included the communities' particular literacy and livelihood needs and strengths.

BOX 3: Nine mobile-phone projects

- ▶ **Afghanistan:** a mobile phone-based literacy component (SMS texting accompanied by notebook writing) aimed to reinforce a non-formal fast-track literacy program targeting illiterate and neo-literate young and adult women in rural areas.
- ▶ **Cambodia:** a mobile-phone component (SMS exchange) meant to improve communication and coordination among female commune counsellors as part of a women economic empowerment programme; women received information on agriculture, market prices, and emergencies.
- ▶ **India (1st project) ESL:** a three pronged research project focusing on children's learning of English as a Second Language (ESL) used a mobile-based game to teach and recall words and phrases; piloted in formal, non-formal and informal education contexts in rural and urban slums.
- ▶ **India (2nd project) Tamil Nadu, Theni District:** low-cost mobile phones were used as learning and business tools by illiterate and semiliterate women farmers as part of lifelong learning and social capital processes including vertical and horizontal knowledge transfers related to the women's goat-rearing enterprises.
- ▶ **Morocco:** ethnographic research study targeting non-literate semi-literate women from an oral-based Berber community; it aimed to increase women's ability to text using mobile phones in relation to their livelihoods, and in particular as way to enable their participation in a traditionally male dominated water-management system.
- ▶ **Niger:** a mobile phone texting module was incorporated into a non-formal adult literacy and numeracy programme.
- ▶ **Pakistan:** mobile phones were used to support a non-formal literacy curriculum by enabling women to practice acquired literacy skills via SMS texting dealing with various daily life topics: sanitation, water, maternal health.
- ▶ **Senegal:** a non-formal literacy component of a community empowerment programme was enhanced by a mobile phone-based literacy intervention using SMS/texting to practice acquired literacy skills.
- ▶ **Somalia:** a mobile phone-based component with emphasis on financial literacy skills was integrated into a community empowerment programme targeting Somali youth and their livelihoods/employment skills.



Part III:

Cross-Analysis of Nine Projects:
Trends and Outcomes

At the core of this report is the cross-analysis of nine projects selected from three world regions with the aim of further understanding how they have used mobile phones to enhance literacy, with particular attention to women and their empowerment. Trends and outcomes identified across the projects are presented taking into account three main domains: project contexts and rationales; the mobile learning process; and project sustainability.

Project Implementation Contexts

'Literacy has no autonomous 'effect' on development in any form (cognitive, social, political or economic); instead, in each case literacy's influence is filtered through its interactions with complex, contextual particularities'.⁸⁸

The acquisition and application of mobile phone-enhanced literacy by individuals is influenced by dynamics of gender relations in their societies. 'In many societies it is men, not women, who are expected to practise literacy skills in public [leading positions], while women are expected to practise their skills in private.'⁸⁹ Yet literacy can also change gender relations, including those that are unequal, by providing skills and access to knowledge that can potentially lead to individual and social change.

As well as gender, other socio-economic and cultural factors such as poverty, race, ethnicity, language, religion and disabilities can diminish how, where and to what extent literacy skills enhanced by mobile phones are practiced.

When looking at adult literacy rates available in the 1950's, historically when there is a first complete assessment of regional and national differences,⁹⁰ literacy rates are higher among men than among women. On average, at that time disparities were more pronounced in Africa or Asia than in Latin America. 'The prevalence of literacy, and the rate at which it increased, tended to be higher in urban areas than in rural areas. In developing countries for which subnational literacy rates were available, significant disparities in literacy levels were found between different

88 Barlett, L. 2003, pg. 70.

89 UNESCO, 2005a, pg. 205.

90 *ibid* with reference to UNESCO 1957 adult literacy compilations, pg. 193.

linguistic, ethnic, religious and racial groups⁹¹. To date in the 21st century, similar disparities and inequalities as the above persist.

The following sub-section addresses the various socio-economic and cultural and political contexts where nine projects on mobile phone enhanced literacy took place, with attention given to women.

■ National Contexts: Low Human Development, High Gender Inequality and Low Gender Parity in Literacy

The nine projects reviewed were implemented in eight countries mostly with low and medium values in UNDP's 2012 Human Development Index (HDI):⁹² low development: Afghanistan, Pakistan, Senegal, Niger, and Somalia (the lowest HDI value among all countries); medium development: Cambodia, India; high-development: Morocco (Table 1).^{93 94} The lower the levels of human development in the project countries, the higher gender inequality is as measured by UNDP's 2012 Gender Inequality Index (GII)⁹⁵ with Niger (GII 0.707) doing just slightly better than Afghanistan (0.712) and Somalia at the highest level of inequality (GII 0.77). However, India has a better value in HDI (0.583) than Cambodia, Pakistan or Senegal, yet still fares worse than those countries in terms of gender equality.

In terms of gender parity and literacy,⁹⁶ as measured by the Gender Parity Index (GPI) for both adult and youth literacy rates, Niger and Afghanistan score very low. GPI is higher for youth literacy rates than for adult literacy rates in all project countries, corroborating global trends reflecting increased access to primary and secondary education by younger generations.

91 Ibid

92 Human development index (HDI) A composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living. The HDI does not reflect on inequalities such as poverty, human security, empowerment. Thus we include the GI.

93 Human Development Index Table 1, HDI 2012. UNDP; data retrieved June 2014. HDI of 2012 is selected taking into account that most of the projects were implemented within the range of 2010-2012.

94 For Somalia, UIS data or WIDE data is not available in relation to literacy rates and GPIs. HDI ranking and GI value for Somalia are derived from the Human Development Report for Somalia of 2012 which makes use of a 2010 household survey with the aim of placing Somalia at a comparative level with other countries in the Human Development Report of 2010.

95 The closer to 1, the worst the inequality. Gender Inequality Index, Table 4, 2012, UNDP; data retrieved June 2014.

96 UIS Database with most current data retrieved in June 2014. None for Somalia.

TABLE 1: Human development, gender equality and gender parity in literacy across the 8 project countries

Project Countries	HDI Value 2012 (187 countries)	GII Value 2012	Adult Literacy Rates			Youth Literacy Rates		
			Male	Female	GPI	Male	Female	GPI
Afghanistan	0.466	0.712	45.42	17.61	0.39 (2011)	61.88	32.11	0.52 (2011)
Cambodia	0.579	0.473	82.75	65.93	0.80 (2009)	88.36	85.87	0.97 (2009)
India (2 projects)	0.583	0.61	75.14	50.82	0.68 (2006)	88.41	74.36	0.84 (2006)
Morocco	0.614	0.444	76.07	57.64	0.76 (2011)	88.83	74.03	0.83 (2011)
Niger	0.355	0.707	23.25	8.94	0.38 (2012)	34.53	15.06	0.44 (2012)
Pakistan	0.535	0.567	68.6	40.3	0.63 (2011)	78.04	63.14	0.81 (2011)
Senegal	0.484	0.54	0.54	40.42	0.61 (2011)	73.93	59	0.80 (2011)
Somalia	0.285 ⁹⁶	0.77	Based on the 2012 HDR for Somalia (using a 2010 household survey), the education dimension is at the lowest (0.118) followed by income and health indices.					

Source: UNDP, UIS

Local Contexts: Rural Communities – Poor, Diverse, Conservative and Young

Gender disparity and inequality at local levels tend to be linked to poverty; poor reproductive health; low civic and political participation; lack of education; and diminished economic and labour market opportunities. The poorest families and the most disadvantaged women and girls live in rural areas, and have the least access to basic public services, including education, health, transportation, water and electricity.⁹⁸ The projects reviewed in this report were all implemented in rural areas except a project that focused one of its pilots on children from an urban slum in Hyderabad, India.

Ethnic and linguistic diversity

Most of the projects involved populations with diverse ethnicities, languages and dialects. Such was the case for the projects in Somalia and Senegal,⁹⁹ and in Niger, where the project involved three¹⁰⁰ of the country’s eight major ethnic

97 UNDP, 2012.

98 UN, 2013.

99 In Casamance, Southern Senegal - Fulani (75%) and large minorities of Mandinkas (9%), Soninke (8%) and Wolof (6%).

100 The Dosso and Zinder regions are populated, the first by Zarma and Hausa ethnic groups and the second by Hausa and Kanuri.

groups. The project in Morocco¹⁰¹ involved an oral-based community speaking Tashelhit, one of the three main Berber dialects in Morocco, and occasionally using Moroccan Arabic (Darija – a combination of Arabic, French and Spanish).

Conservative religious/traditional socio-cultural beliefs

Most of the projects were set in traditional Muslim communities (Morocco, Senegal, Afghanistan, Pakistan, Somalia) with Sharia and traditional customary law applied in Somalia and with Pakistan's legal system based on the 1973 Constitution, incorporating some elements of Sharia. In such contexts, conservative religious beliefs formally and informally regulate education, and public and private life, including gender relations.

In Somalia, family law guarantees women's rights in marriage, divorce and inheritance. However, civil issues are usually resolved under Sharia and *xeer* (traditional or customary law). In this regard, for example, Islamic Sharia potentially offers women 'more rights than *xeer*, however, in Somalia, Sharia is only administered by men, and is often misapplied in the interests of men – this means that women do often not receive justice, and men go unpunished'.¹⁰² Gender inequality pervades all layers of human rights: 'compensation for loss of life is typically 100 camels for a man and 50 camels for a woman'.¹⁰³ Polygamy, child marriage, forced marriage and female genital mutilation (FGM) are common and prevalent harmful practices in Senegal¹⁰⁴ and Somalia, especially in rural areas. In Senegal, nearly 20% of all girls married between the ages of 15 and 19 are married into polygamous unions.¹⁰⁵ Teenage pregnancies also remain a problem.¹⁰⁶

Young and unemployed

Most project settings involved youth. The Morocco project in Berber rural communities also engaged with elderly women and the project in North and South India also involved children. Most of the youth involved in the projects presented low literacy rates and high unemployment rates, with women faring worse than men. The project in Cambodia assessed that, 'with the youngest population in Southeast Asia, 50 per cent are younger than twenty-five years of age – there is a lack of productive skills and inadequate employment for the current and emerging workforce. The result is that many struggle to make a living with the effects particularly pronounced for women and those living in rural areas'.¹⁰⁷ The same applies in the project in

101 Dodson, L. 2014.

102 UNDP, 2013a.

103 *ibid*

104 While the Wolof population generally does not practice FGC, the Diola population does, raising the prevalence to 94 per cent in the Diola-populated region of Kolda, compared to the national average of 26 per cent. In UNESCO 2013h, based on 2010-2011 Demographic Health Survey (DHS) report for Senegal.

105 OECD, 2012.

106 World Bank, 2012.

107 UNESCO, 2013c.

Somalia, a country with 70 per cent of the population under 30 and with two-thirds of those 14 to 29 unemployed; unemployment rates are higher among women than among men.¹⁰⁸ In the project¹⁰⁹ in 25 villages in the Theni District in Tamil Nadu, India,¹¹⁰ the population was characterized mainly by adults below the age of 40. In Senegal, 58 per cent of the population is less than 20 years old.

Agricultural livelihoods and gender

People in rural areas in the projects rely for their income mostly on agricultural labour, including agro-pastoral traditions, and also receive remittances sent home by migrants. The project in the Theni district in India focused on women from households below the poverty line who rely on goat-rearing. In the project involving women in Berber communities in rural Aït Baamrane, Morocco, households rely on the production of argan oil – produced from the kernels of the argan tree – tend to animals/livestock, and have small gardens for seasonal harvest, in addition to being supported by remittance income.

In family agricultural enterprises in rural areas, women tend to be self-employed to a greater extent than men, who also work for wages or in non-agriculture jobs. However, women in rural areas are responsible not only for agricultural work (with less benefits for them than for men)¹¹¹ but also for household chores, including fetching water. Lack of water considerably affects livelihoods in rural Aït Baamrane. Village women and children are the primary water collectors, typically spending 3.5 hours a day collecting water, often in temperatures over 38 degrees Celsius.¹¹²

In general, labour force participation is usually lower for women than for men. In Niger, labour force participation is 36.2 per cent for women versus 86.8 per cent for men. In Somalia, women face higher unemployment rates (at 74 per cent) than their male counterparts (61 per cent). Only 22 per cent of Pakistani women work, they earn less than a quarter of men's earnings, and do not have access to credit.¹¹³ This is compounded by an unequal distribution of wealth: 2 per cent of the households control more than 45 per cent of the land.¹¹⁴

Female-headed households

In rural areas in the projects reviewed, many women have been left as head of their household as a consequence of widowhood, polygamy, emigration of their husbands, or displacement related to unemployment, lack of water, conflict or civil unrest. These households are usually among the poorest in their communities.

108 UNDP, 2012 as quoted in UNESCO, 2013g.

109 Balasubramanian, K., et al., 2010.

110 *ibid*

111 FAO, IFAD, ILO, 2010.

112 Dodson, L. 2014.

113 World Economic Forum, 2012.

114 World Bank, 2011.

In the project in Morocco, female-headed households have fewer working adults. Women generally earn less than men, are often unable to pay school fees for their children, or remove their children from school to perform chores.¹¹⁵ At the same time, polygamous marriages, common in Niger, Senegal and Somalia, place women as responsible for their own children, and many engage in informal and agricultural work to improve the household livelihood.

Diminished voice and participation/decision-making

In countries where the projects were implemented, formal and informal social controls strongly limited women's opportunities to make their voices heard, to participate and to make decisions, at local and national levels.

Women who head households sometimes have more autonomy and decision-making power, but this can diminish when husbands or sons return to rural households, even sporadically. In the project in Morocco, which involves women's participation in a fog water harvesting and management system, the presence of male authority was reported to limit women's participation in water management as well as their household decision-making power.¹¹⁶ Such male authority was also felt long-distance when it was communicated via family members or ICTs. In such cases the absence of husbands is reported as a factor delaying community projects.¹¹⁷

In Somalia, conflict has pushed many women to fend and decide for themselves and their children: 70 to 80 per cent of refugees and internally displaced people (IDPs) are women and children. Yet women suffer from political exclusion as a result of Sharia and clan-based laws that perpetuate gender inequality and gender-based poverty, which are reflected in Somalia's low HDI ranking and high GII value. 'Since the re-emergence of customary law in 1991, the extended use of Sharia law has left women virtually voiceless in the political and judicial spheres. (...) With regard to formal political participation, women hold a mere 8.2 per cent of parliamentary seats'.¹¹⁸ In addition, according to UNDP,¹¹⁹ Somali women are not protected from violence and discrimination by the Somali judicial system. Somali girls are given away in marriage at a very young age, violence against girls and women is widespread, and traditional laws are highly discriminatory against women.¹²⁰

Low female parliamentary participation is often accompanied at community level by a patriarchal domination of decision-making related to family, financial and education decisions with the latter limiting access of girls to school. This is the case in the projects in Afghanistan, Morocco, Niger, Pakistan and Somalia. In Niger,

115 Dodson, L. 2014.

116 *ibid* and Dodson, L.; et al., 2013.

117 Dodson, L., 2014 with reference to Morsen, J. H., 2004.

118 UNDP, 2012 quoted in UNESCO, 2013g.

119 *ibid*

120 *ibid*

according to custom and civil law the husband alone has parental authority,¹²¹ but intra-household decision-making and the role of women vary considerably among ethnic groups. Overall, socio-cultural norms do not permit younger, married women belonging to the Hausa ethnic group to travel to markets, either individually or in groups, but among the Fulani, Touareg and Zarma, women often travel to markets.

Cultural norms in Afghanistan and Pakistan often require that girls and women ask fathers or husbands for permission to leave the house, and must be accompanied by a male or other women and children. In Pakistan, only 18 per cent of women participate in decisions about their own education, while 86 per cent of men do.¹²²

Low literacy levels, non-formal education and self-learning

Most people involved in the projects had low literacy levels or no literacy at all (mostly self-reported and/or tested by the project). Non-formal education interventions are more common in reaching these communities; most of the projects reviewed built on such initiatives to integrate mobile phones into existing learning processes. An exception were two pilot components in one of the projects in India that involved children and the use of mobile phones and games for learning English as a Second Language (ESL) in a formal school setting as well as in an informal educational one.

Some communities propose their own learning methods to improve literacy. In the project in Morocco, women had taught themselves and one another to use mobile phones, including SMS features, by relying on visual literacy strategies along with collective learning. A similar dynamic of self-directed, collective learning was documented in the ICT-based Lifelong Learning for Farmers' project in India (Theni district), where women were supported by their families and community in the learning objectives of the project.

Access to education can suffer acutely in situations of conflict and civil unrest, as has especially been the case in Afghanistan, Pakistan and Somalia. In Somalia, destruction of school infrastructure, the displacement of millions of people, and the lack of central government and a budget for education has affected seriously the provision of education. Educational opportunities were also limited by a scarcity of schools and a lack of transportation over the long distances that many have to travel from home to school.

121 Ministère de la Promotion de la Femme et de la Protection de l'Enfant, Institut National de la Statistique; et Fonds de Nations Unies pour l'Enfance. 2009. Analyse de la situation de l'enfant et de la femme au Niger 2008 as quoted in UNESCO, 2013e.

122 Hou, X., 2011.

Technological infrastructure in rural areas: Access and use of mobile phones

While the mobile phone sector – as represented by increasing mobile subscriptions – is growing rapidly in all the project countries at national levels, networks did not always reach rural areas. For example, in Afghanistan the mobile sector was highlighted to be a main employer but technological infrastructure and network coverage in rural areas of the project were not reliable. In Niger, mobile phone coverage has focused on urban centres, border markets and regional capitals. 'At project sites, quality of mobile phone coverage was often unreliable. Mobile phones services in Niger are still quite expensive. (...) Mobile phone adoption in the targeted villages was at 30 per cent in all households in the project sample: either owned by an individual respondent or shared within the household'.¹²³

As part of its evaluation mechanism, the project in Senegal's rural Velingara district established as part of a baseline context that only 8 per cent of 616 women surveyed reported having access to electricity. Participants often developed innovative ways to charge mobiles, however, using generators, car batteries or solar panels: in a sample of 118 participants, only 4 per cent said they had difficulty charging their mobile phones.¹²⁴

At the same time, other ICTs appear to have a strong presence in rural households: in the project in the Theni district in Tamil Nadu, India, '[m]ore than 97 per cent of the households have television and around 80 per cent have television with satellite connections. This phenomenon is generally seen in Southern India, where private and government channels have a strong presence. On the other hand, the use of radio and landlines is minimal'.¹²⁵

Sharing mobile phone devices across and within households was common across project communities. In the Morocco community, women fund their own mobile phones, paying as much as 40 per cent of their monthly income from argan oil production, depending on the time of year and family circumstances. For some women, the mobile phone replaced physical mobility, which was often restricted for financial and cultural reasons. They rely on pay-per-use call packages and installing a very limited calling credit on an as-needed basis using old phones that they buy second-hand. 'Women occasionally prioritize spending on their mobile over both personal necessities'.¹²⁶

Few of the projects documented gender dynamics in how mobile phones were actually used at local levels (as opposed to quantitative measures of how many mobile subscriptions are taken out by men and women at national or regional levels). Two projects are exceptions: in the project in Morocco, access and use of mobile phones

123 UNESCO, 2013e.

124 CEGA. 2010. *Do SMS Text Messaging and SMS Community Forums Improve Outcomes of Adult and Adolescent Literacy Programs? Evidence from the Jokko Initiative in Senegal.* [report] quoted in UNESCO 2013h.

125 Balasubramanian, K., et al. 2010.

126 Dodson, L. et al. 2013.

were examined as culturally conditioned. For instance, cultural norms prevent unrelated women and men from engaging in private conversations in person. For some, this prohibition extends across technologies to include text-to-text and phone-to-phone contact.¹²⁷ The project in the Theni district in Tamil Nadu, India, paid attention to how rural women used mobile phones as a resource, and how this triggered change both within households and in broader society.¹²⁸ Following a gender dynamic contributing to women's use of mobile phones beyond issues of access, in West Bengal, India, it was noted that 'Men have purchased all the mobile phones in the village, and all the shops with public phones belong to men. However, in many houses women are in charge of delivering news and operating the phone, because their husbands need to be on the road to purchase stocks or sell products. The phones are used collectively by the entire family and even the neighbourhood'.¹²⁹

Project Rationales: Literacy and Empowerment

The above socio-economic and cultural contexts where the nine mobile phone projects took place present a multitude of issues affecting women and girls in rural areas. The following section describes the rationale and purpose of the projects, with reference to the three broad conceptions of literacy outlined above and detailed in Annex 2.

■ Mobile Phone Projects with an Understanding of Literacy as Autonomous/Neutral Skills

Four projects – in Afghanistan,¹³⁰ India,¹³¹ Niger¹³² and Pakistan¹³³ –presented an understanding of literacy as a set of autonomous/neutral skills (reading and writing, and numeracy skills), akin to the UNESCO literacy definition of 1958. This may be

127 Dodson, L. 2014.

128 Balasubramanian, K., et al. 2010.

129 Tenhunen, S. 2008 in Balasubramanian, K., et al. 2010.

130 'to promote basic literacy among women in rural Afghanistan by complementing ongoing classroom literacy sessions with text messaging instruction; and with this offer them an opportunity to improve their lives, those of their families and their larger communities'.

131 'Mobile game-based learning for English Second Language (ESL) acquisition' and 'to understand the impact of immersive, mobile game-based learning as a complement to school and other educational resources'.

132 'to increase the usefulness of writing skills by providing people with mobile phones' (...) 'To increase the application of writing skills in the context of cash crops and to improve their agricultural marketing knowledge; teach basic functional literacy and numeracy to adult learners through mobile phones'.

133 'to help retain literacy and numeracy skills of new literate women' and 'the primary objective of this project was the empowerment of young rural women, in order for them to enjoy an improved status and livelihood through exposure to increased knowledge and access to technology'.

indicative of these projects' response to illiteracy and low literacy rates identified as a trend across populations in rural areas including women and children.

For example, one of the projects in India (project 1) aimed to enhance the literacy sub-skills¹³⁴ of boys and girls in low-income rural areas (and in urban slums) via mobile game-based learning of English in non-formal, formal and informal education contexts. The projects in Afghanistan and Pakistan aimed to help women not only acquire basic reading and writing skills but also to retain these skills. The rationales of the projects in Afghanistan, Niger and Pakistan also expressed concern about the empowerment of rural young women (in the case of Niger, women and men). But their approaches to literacy as well as their activities, including learning processes, did not go (as designed and evaluated) beyond a reported acquisition of basic literacy skills. In this regard, the application of these skills in participants' daily lives and work, as envisaged in the definition of functional literacy, remained short. Similarly, any increase in women's voice and participation thanks to literacy skills acquired remained reported only at an anecdotal level, and/or as a spill over effect enhancing the community's approval and support of the project.

The project in Niger was based on the observation that 'illiterate traders in Niger were teaching themselves how to read and write in order to be able to benefit from the lower prices that sending SMS offered compared with calling. If mobile phones could encourage illiterate traders to become partially literate, how useful would it be to incorporate mobile phones in adult literacy classes?'¹³⁵ In consequence, this project provided mobile phones and instruction to adults (including participants from producers' associations) on how to use mobiles in literacy programmes (including 'functional literacy topics'). However, connection of acquired reading and writing skills back to the trade or production activity was not made or followed up on.

■ Mobile Phone Projects with an Understanding of Literacy as Applied Skills (Functional Literacy)

The projects in Senegal and Somalia had rationales similar to UNESCO's 1978 definition of functional literacy, in which basic literacy skills, including numeracy, are applied to individuals' immediate work and community contexts. This approach was partly a response to low literacy and diminished labour opportunities for women and youth as presented in these projects' rationales and purpose.

134 'literacy sub-skills' that 'constitute the major predictors of success on reading comprehension, especially phonological awareness, orthographic awareness, oral vocabulary knowledge, phonetic decoding, and word identification, including fluency in word reading'.

135 UNESCO, 2013e.

The Senegal project¹³⁶ could also qualify as having an approach to literacy as autonomous/neutral skills, due to its main focus on retaining participants' literacy skills. This was done by providing participants (women and men)¹³⁷ the opportunity to practice basic literacy skills via SMS messaging during an ongoing non-formal literacy component offered as part of an overall Community Empowerment Program (CEP). Participants also made use of digital and visual literacy skills linking mobile phone menu features with visual symbols and signs related to mango picking– a common community livelihood practice. The mobile phone literacy component was created as a response to an identified drop in participants' attendance and motivation during the third phase of the CEP, and the low retention of literacy skills among participants.

The intervention also addressed 'project management skills' as part of an overall empowerment programme focusing on human rights, democracy, problem-solving, hygiene and health, so participants also had a chance to apply literacy skills in their work and daily lives. This would qualify the project as addressing functional literacy, with nuances of empowerment through critical literacy. Nevertheless, some caution is required: can any identified change at a literacy or social level be attributed to the mobile phone literacy component or rather to the ongoing literacy component of the wider CEP? Or even just to the latter?¹³⁸

An SMS aggregation/disaggregation mechanism¹³⁹ for information exchange and dissemination was also used by the CEP to reach a wider population than the communities that initially received the mobile phone literacy classes. It was intended to 'amplify the voice and influence of youth and marginalized groups in community decision-making' and 'provide villagers with a platform for exchanging information, broadcasting ideas and organizing local advocacy work'.¹⁴⁰ This component comes close to being an application of mobile phones to literacy that is useful for individual and social change, but it was not evaluated methodologically and has remained anecdotal.

In the Somali project, literacy was conceived in terms of functional skills, including financial literacy and digital skills that would enable unemployed youth – and young women in particular – to improve their livelihoods.¹⁴¹ As in the case of Senegal, the mobile phone component was linked to a wider community empowerment programme focusing on improving the livelihoods of youth. The implementation of this mobile phone technology intervention¹⁴² aimed to 'build basic money management skills (financial skills) among youth and women so that they could make informed decisions about their personal, households

136 Mobile phone literacy component that complemented the literacy initiative within an overall program 'Community Empowerment Program' (CEP).

137 Beginning in 1988 CEP initially targeted only women and girls but then evolved to include men and boys.

138 UNESCO, 2013h.

139 RapidForum developed by UNICEF was used to disseminate information.

140 UNESCO, 2013h.

141 UNESCO, 2013g.

142 Ibid; Dab iyo Dahab (means Gold and Fire)

and/or small businesses' and was used 'as a tool to empower Somali youth, particularly young Somali women, and more generally, to enhance existing grassroots education, financial literacy, and poverty-reduction initiatives'.¹⁴³ The overall Somali community empowerment programme has been documented as boosting job training and placement for 8,000 young people (women and men). The mobile phone intervention relied on interactive audio instruction and an SMS exchange system of information about financial skills, connected to the community empowerment financial literacy curriculum for youth at large. A web-based platform¹⁴⁴ was also provided to track learners' participation and learning progress. Tests before and after showed statistically significant improvement in skills, with the youth livelihoods programme being linked to job placements.¹⁴⁵

■ Mobile Phone Projects with an Understanding of Literacy as Lifelong Learning for Individual and Social Change/Critical Literacy

Three projects –in Tamil Nadu, India (Theni district), Morocco and Cambodia – presented an understanding of literacy akin to a conception of lifelong learning with a critical literacy perspective. That is, literacy is understood primarily in relation to its potential to empower people by bringing change at individual and social levels; as this occurs, earlier missed educational stages can be engaged. In this sense, someone can still learn and increase their voice and participation without being fully literate, while acquiring missed literacy skills as they go along. This can be the case when learning takes place in cooperation with others within a collective agency motivated by the expectation of receiving social and economic benefits linked to empowerment in terms of voice and participation and labour/livelihoods.

Along these lines, the rationale of the project in Tamil Nadu, India, notes that its design is based 'on the premise that open and distance learning (ODL) and information and communication technologies (ICTs) can add value to the developmental process by reaching the unreached and facilitating self-directed learning among farmers, landless labourers, and various marginalized sections of the rural communities. Such learning should take place in the context of the entire social and economic value chain of rural society'.¹⁴⁶ In this case, the mobile phone project was integrated with livelihood strategies, micro-entrepreneurship, and bank credit related to goat-rearing by women with few or no literacy skills.

143 *ibid*

144 All mobile services designed by a private company - 'Founded in 2006, Souktel designs and delivers custom mobile solutions that connect job seekers with employers, and help development implementers get information to & from the people they serve' (per company's website).

145 As evaluated by the implementing agency Education Development Center (EDC) and as reported in the USAID State of the Field Report: Examining Evidence in Youth Workforce Development, USAID Youth Research, Evaluation, and Learning Project. Final Report 2013.

146 Balasubramanian, K., et al. 2010.

'The assumption was made that 'when stakeholders in the primary sector are facilitated in understanding the learning process around a specific area relating to their livelihoods, they will enhance the learning in the other areas thereby becoming lifelong learners. Such learning will take place, not only from a vertical flow of knowledge – from knowledge institutions to the community, but also from the horizontal transfer of knowledge – the passing on of knowledge within the community'.¹⁴⁷ Within this framework, the project purpose was presented as empowering women in non-formal learning settings with low-cost technologies (including mobile phones) and offering the means to accelerate this process in the context of social capital.

In this regard, the project qualitatively illustrates the significance in enhancing women's voice and participation with the following participant's response.

*'I do not allow my husband to touch the mobile phone,' said Yadulamma, a project participant. 'One day while going for grazing, I found that the phone was not working. Since I was going for grazing I requested my husband to take the mobile phone to Vidiyal's office [the office of the project NGO] where an engineer comes every Monday to attend the complaints about the handsets from SHG [self-help group] members. The engineer repaired my phone and gave it to my husband. When my husband brought it back, I found the phone was still not working. I opened the phone and found that the tongue was missing.'*¹⁴⁸

By 'tongue,' Yadulamma meant the SIM card. When the staff told her that it is called a SIM card, she said that it is like a tongue, without which the phone cannot speak.

*'I shouted at my husband for missing the tongue and rushed back to Vidiyal's office. With the staff of the Vidiyal, I searched and found the tongue. Later I told my husband that I would never depend on him for repairing the mobile phone.'*¹⁴⁹

Similarly, the project in Morocco was linked to women's participation in a fog water harvesting system that delivers water from the Anti-Atlas Mountains to Berber villages. The system helps reduce the time women spend fetching water, freeing them to dedicate more time to an economic activity, such as the artisanal production of argan oil or other products in local cooperatives. The rural Berber women face cultural and religious communication constraints, as well as low literacy levels within a traditionally orally based community. The project focused on using available, simple mobile phones to help increase women's literacy skills in combination with visual literacy, so that they could participate in the water-

147 *ibid*

148 Referred and quoted in Balasubramanian, K., et al. 2010. This is the citation of a village woman participating in the L3 project; it was translated into English from Tamil by the researchers, as best as possible.

149 *ibid*

management system by reporting water problems (hitherto a male task).¹⁵⁰ As in the Theni District project in India, ongoing self-directed and collective learning played a role in enhancing women's ability to use their phones.

In the project in three provinces in Cambodia, mobile phones were used to enhance an existing 'Women's Economic Empowerment Programme'. This programme aims 'to empower women in rural areas by enabling them to participate in the marketplace, to improve their safety and security', 'to strengthen self-confidence and leadership skills, and to improve female counsellors performance'.¹⁵¹ With regard to women's decision-making skills, the mobile phone component aimed 'to promote female counsellors' leadership skills to better serve community members through mobile phones'.¹⁵² These counsellors are community members – Female Commune Counsellors – elected to a commune council, the lowest level of public administration in Cambodia. Every commune council must appoint a woman counsellor.

However, despite the potential of linking the mobile phone to concrete processes of decision-making, the project's objective was documented to be linked to practical purposes of communication and coordination: 'The intention was to spare the women from traveling long distances, walking or cycling to meet other women coordinators'. It is worth recalling that Cambodia, despite being low ranked in terms of HDI, was faring the best in 2009 among all project countries reviewed in this report in relation to gender equality (GII) and gender parity pertaining to adult and youth literacy rates, with a GPI of 0.97. This could have paved the way for the project to focus on further empowering women who are starting to exercise their voice and participation as Female Commune Counsellors; however in this project, the mobile phone contribution remains at the level of communicating and exchanging information, with application of the information to decision-making documented only at an anecdotal level.

The Mobile Learning Process

■ Literacy Levels in Learners

The nine projects reviewed in this report engaged children as well as youth and adults: five of the projects – in Afghanistan, Cambodia, India (Theni District), Morocco and Pakistan, focused on young and adult women. Among these, with

150 Dodson, L. 2014.

151 Specific objectives: (i) to enable women to receive information on agriculture, market prices and disaster-preparedness through mobile phones; and (ii) to enable women to share knowledge and to report emergencies and domestic violence.

152 UNESCO, 2013c.

the exception of Cambodia¹⁵³, women's basic literacy skills were identified as absent or at very low levels; oral literacy was predominant in the Berber community of Morocco. The India ESL literacy project¹⁵⁴ focused on rural and urban slum children. Three projects – in Niger, Senegal and Somalia – engaged youth and adults as their target population. These projects noted an absent or low literacy level¹⁵⁵ in their target population yet did not use a specific gender or female focus as a base for their intervention. However, sex disaggregation of participation can be identified in the projects in Somalia (247 female and 313 male) and in Senegal, which reported 'mostly adult and adolescent women (...) with women being 49 per cent of all adult participants, and girls making up about 58 per cent of the adolescent class (22 per cent of total participants)'.¹⁵⁶

Sex disaggregation was still inherent to the Niger project, as the mobile-based literacy intervention had to be provided in separate male and female sessions because of cultural norms; this then allowed for literacy outcomes to be measured by sex with no outstanding difference: 'The programme had relatively equal effects on men and women, young and old. Women's test scores were relatively lower at the outset (and also after the programme)'.¹⁵⁷ In the Indian ESL project focusing on rural and urban slum children, pre-existing literacy levels were not documented,¹⁵⁸ and were inferred by the participants' school grade level and observation of how students wrote their names in English (their second language). Sex disaggregation of participants was only documented for the after-school rural pilot with 27 children (11 boys and 16 girls), but outcomes of the intervention were not broken down by sex.¹⁵⁹

■ English Second-Language Acquisition in Children

English second language sub-skills and village games

The India ESL project¹⁶⁰ focused all of its three pilots (A, B, C) on children, using a prototype mobile-based game designed to teach and test the comprehension and recall of English words and phrases. All three pilots focused on developing literacy sub-skills that 'constitute the major predictors of success on reading comprehension, especially phonological awareness, orthographic awareness, oral vocabulary knowledge, phonetic decoding, and word identification, including

153 The case study (UNESCO, 2013c) documents anecdotally the educational level of a female counsellor as grade 2 primary education.

154 UNESCO, 2013i.

155 No literacy levels were formally documented in case study (UNESCO, 2013i) aside from what can be inferred by school grade level of participants and observations of how student wrote their names in English in Pilot A.

156 UNESCO, 2013h.

157 UNESCO, 2013e.

158 UNESCO, 2013i. (Pre and post tests were administered but there are not details for the baseline in this background case study).

159 *ibid*

160 *ibid*

fluency in word reading'.¹⁶¹ The games were designed with screens that would address and revise each skill –mastering a skill is required to win the game. 'The screens and games were sequenced to correspond to when the sub-skills were expected to be covered over the academic year'.¹⁶² In pilots A and B, mobile games for English literacy learning were designed to match the learners' curricular needs as determined by the local English curriculum.

It is significant that the design and prototype of the mobile learning software used in the pilots was based on an initial project assessment of children's educational challenges and learning contexts. This included understanding 'how rural children grew up playing traditional village games, whose rules and game mechanics were qualitatively different from those found in contemporary Western video games, and therefore they struggled to understand the initial mobile games that we introduced'.¹⁶³ Seventy-four qualitative differences were identified between traditional village games and Western games, which were subsequently used to guide the video game design processes.

Three kinds of learning settings

In the India ESL project, one of the pilots (B) focused on urban slum children attending low-fee private schools in Hyderabad. This pilot involved the selection of 250 grade 5 students attending these schools qualifying it as formal education intervention. The mobile phone with the game-based learning application was used during '59 to 90 sessions'¹⁶⁴ that were integrated into existing non-official class periods during an entire academic year. These periods aimed to help students catch up on homework or to enable teachers to conduct extra examination review sessions.

The non-formal education pilot (A) used the same mobile game-based application for learning English, but as part of an after-school programme. This was run and hosted in the afternoon by a private school in a village in north India¹⁶⁵ but was open only to children in neighbouring villages whose parents could not afford the fees for this private school and who therefore attended public schools. This pilot engaged twenty-seven children (eleven boys and sixteen girls) from grades 2 to 9 during twenty-seven two-hour sessions that took place three times a week.

The India ESL three-pronged research project included an informal education intervention (pilot C) in which mobile phones with the game application for learning English were given to eighteen rural children in India over a 26-week period. The children were responsible for caring for the phones and recharging the batteries at home. The project staff visited the participants twice a week during the first ten

161 *ibid*

162 *ibid*

163 *ibid* and Kam, M., Mathur, A., Kumar, A. and Canny, J., 2009.

164 UNESCO, 2013i.

165 *ibid* and Kam, M., Kumar, A., Jain, S., Mathur, A. and Canny, J. 2009.

weeks to ensure that they were confident about solving simple technical problems on their own.

A pedagogical or a supervisory role for teachers?

In pilots A and B, facilitators and teachers mostly had managerial/supervisory or technical support roles:

- *Managerial/supervisory role:* The pilots were run by school personnel, or by local facilitators whom the project hired, in the case of the afterschool programmes'. Teachers and/or facilitators handed out a phone to each child at the start of each pilot session and took back the phones at the end of the session; 'teachers decided when a mobile learning session should occur. In addition, teachers frequently cancelled these sessions in order to free up time for an exam review'¹⁶⁶(in the case of the unofficial school-class component).
- *Technical support:* Facilitators and teachers provided technical support whenever a child struggled with usability or technical issues with the phones or the games. In pilot studies A and B, facilitators and school personnel were responsible for recharging the phone batteries before the next session.
- *Explicative role:* Each new game was taught to the children by project team members as well as by teachers/facilitators. 'With a good human-centred design process and technical support, it wasn't challenging [for children] to figure out how to operate the mobile applications. And children who figured out how the games work were always excited to teach their friends who haven't'.¹⁶⁷

A 'human-computer interaction approach', which looks into 'how the users – including their goals and motivations, and their strengths and limitations – use technology to achieve their goals (or not)',¹⁶⁸ underlies the design and implementation of all three pilots. In this regard, the mobile phone user leads the learning process, with little participation from the teacher yet with peer-to-peer support. However, as noted below, the pedagogical role of the teacher in mobile-based learning is key for learners with weaker literacy levels; those with a stronger level may guide their own learning.

Outcomes – Quantitative significant post-test gains in acquired English language skills

As part of its self-evaluation, the India ESL project undertook 'three rounds of summative evaluations for a period of four semesters' and 'observed statistically post-test gains on three literacy sub-skills'.¹⁶⁹ However, the baseline English

166 UNESCO, 2013i.

167 ibid

168 ibid

169 ibid

literacy level was only determined informally by observation; for example, in the case of Pilot A, 'we had observed that the majority of participants – all of whom attended public schools – were nevertheless unable to spell their names correctly in English when the pilot started. This suggests that they were receiving poor-quality English literacy instruction in their schools and that any learning gains could be reasonably attributed to our games.'¹⁷⁰ Quantitative and qualitative data were collected that would make evident 'how poor children actually interacted with and around the mobile learning technology and to uncover the rich sociocultural context surrounding the human-computer interaction likely to influence both the use and the adoption of technology'.¹⁷¹

Outcomes were reported by the project's authors as:

Pilot A/non-formal after-school rural intervention: Statistically significant post-test gains on spelling skills.¹⁷²

Pilot B/formal school urban slums: Significant post-test improvements on measurements of orthographic awareness and oral vocabulary knowledge.

Pilot C/informal learning: Each week, the average child learned an average of three new vocabulary words, based on games tracking the extent of their usage of at least 2 hours 23 minutes per week.¹⁷³

Usage tracking on phones revealed educational games to be sufficiently engaging, with participants voluntarily replaying the games in the absence of direct supervision from teachers and parents; three-quarters of their gameplay took place when they were at home or when they visited relatives in the same village. Less gameplay took place outdoors; rural children had much more time to spend on mobile learning every week in everyday contexts than the children in the low-cost urban private schools.¹⁷⁴

In Pilot A, it was noted that 'the greatest predictor of success in spelling the words presented in the mobile phone games was the existing level of spelling proficiency and the grade enrolled in at school rather than the number of sessions attended. The findings thus indicate that rural children who have a stronger academic foundation are better able to take advantage of the benefits afforded by mobile phone based learning. This observation, the authors of the project indicate, is consistent with the findings of He, Linden and MacLeod (2008) whose study with rural and urban low-income children in India showed that weaker students gained more from teacher-directed pedagogical intervention, while stronger students were able to benefit more from a self-paced, machine-based approach to English learning'.¹⁷⁵

170 Ibid

171 Ibid

172 Kam, M., Kumar, A., Jain, S., Mathur, A. and Canny, J. 2009.

173 UNESCO, 2013i.

174 Ibid

175 Valk, J.H., Rashid, A., and Elder, L., 2010.

This implies that mobile learning programmes should integrate teachers more actively than in a supervisory, managerial or explicative role. In the India ESL project, however, the potential role of teachers and facilitators as participants or guides of the learning process is played down, as the project tends to underscore that students can learn on their own, especially in informal learning contexts.

■ **Enhancing Existing Non-Formal Basic Literacy Programmes**

Three mobile phone projects – in Afghanistan, Niger and Pakistan – complemented existing non-formal community-based literacy programmes. Those in Afghanistan¹⁷⁶ and Pakistan focused on young and adult women and were designed and implemented by local non-government organizations and provided through their established non-formal learning centres; the centres in Afghanistan were created at the request of women in communities in this country. The community-based intervention in Niger was offered to separate groups of women and men and was run by a US-based international humanitarian agency.

Content and pedagogy – practicing autonomous skills

The projects in Afghanistan, Niger and Pakistan presented primarily an understanding of literacy in terms of acquiring and retaining basic reading and writing skills. This was also reflected in the curriculum of the literacy programmes that they supported, all in local languages. However, the way mobile phones were integrated into these existing literacy programmes varied, with some having more literacy-related content than others during mobile exchanges. Yet overall the majority was based on mobile phone training (digital skills) and on the exchange of SMS messages that would allow participants to practice literacy skills of the programmes they complemented.

The Afghanistan project ‘design[ed] its own [texting] curriculum, customized to meet the singular needs, challenges, and opportunities of rural Afghanistan’, and ‘complemented the existing literacy instruction in the Fast-track Literacy Curriculum offered at AIL Learning Centres throughout Afghanistan which provide nine-month literacy courses that allow students to move from one level to the next if they pass a test at the end of the course’. In the mobile phone texting component, the AIL literacy material was covered ‘in four months by the project, providing mobile literacy resources that were used to reinforce fast-track classroom engagement aiming to decrease the length of the course through the introduction of constant and engaging mobile component.’¹⁷⁷

176 AIL Learning Centres throughout Afghanistan offer preschool through university level classes; training for teachers and administrators; academic and professional development courses; workshops on human rights and leadership; and income generating skills training like sewing and carpet weaving.

177 UNESCO, 2013a.

Students studied the standard Afghan literacy curriculum in parallel to texting. A 'texting curriculum' was specifically developed for the pilot project. 'Given the experience of the teachers, no additional teacher training materials were required, aside from the list of questions to be posed to the students and the texting instructions'.¹⁷⁸

In the Pakistan project, mobile phone training was provided in a way in which digital skills made the mobile phone a practice tool to reinforce the literacy skills acquired in the existing literacy centres' curriculum. Six to eight messages a day were sent to women and adolescent girls at three different intervals during the day; over 600 messages were sent to the learners' mobile phones covering diverse topics with specific relevance to their lives, including maternal health, economic empowerment, sanitation and water.¹⁷⁹ A system using text messaging software sent these messages to participants expecting them to interact by responding to automatic multiple-choice questions. This mechanism also served to monitor students' participation by recording their responses to sent questions.¹⁸⁰

In the Niger project, a mobile phone module was incorporated into an existing adult literacy and numeracy curriculum. With the aim of establishing a randomized control trial, the mobile phone component was implemented in half of the classes, which were chosen at random. Mobile phone texting took place during eight months within two existing adult literacy classes – one for men, one for women – in each of 134 villages over a two-year period. Literacy classes were held five days per week for three hours per day; one day per week was often allocated to the revision of previous material. It was during this revision day that mobile phones were introduced in half of the literacy classes. As part of the programme, all participants were provided with an enrolment incentive: students who attended at least 80 per cent of classes each month received a food aid ration. Participants were trained in how to use a simple mobile phone, learn where numbers and letters can be found on the handset, and send and receive calls and SMS; one mobile phone was provided for each group of five people.

Among the above three projects, the Afghanistan one demonstrated more detailed content and skills practised via mobile phones as being better connected to the literacy curriculum. Mobile literacy students were given additional assignments (from the traditional literacy class) that were required to be written in their notebooks and texted on their mobile phones. When students wrote in their notebooks, this implied off-line communication (which was a strong aspect of the programme, encouraging students to read and write daily communications, thereby strengthening their literacy retention). The teachers, who were both male and female, routinely monitored these notebooks. The supervisors were males. Teachers sent daily texts to the students, who read the incoming message and

178 *ibid*

179 What the learners did with the information delivered via these messages is not documented in the case study (UNESCO, 2013a).

180 Miyazawa, I., 2009.

responded via return text message. Based on content related to the learner's daily life, messages presented open-ended questions in order to exercise critical thinking skills; answers were submitted in written form. Students were also provided with statements that were incorrect and were asked to rewrite them with the correct information. Students who were able to take on more difficult tasks were given additional, optional questions that were not formed properly. They were asked to rewrite these sentences, putting the words in the correct order. All questions were designed to create discussions that exercised and advanced both literacy and critical thinking skills.¹⁸¹

Literacy and digital skills needed in teachers' training

In the above three projects there was variation in teachers' engagement with the curriculum as well as in the digital skills and literacy levels that they could bring to the projects. In the Afghanistan project, teachers – both male and female – who had a close tie with the community, who already worked in the learning centres and thus who were better prepared to undertake the project activities, played an active role by helping design the curriculum. 'Since this project required the teachers to have some technological knowledge as well as experience as literacy teachers, the project team opted to have teachers also work as mentors to the students. These teacher/mentors worked with the project team to formulate strategies on how to first teach the students to text and then to implement messages into the existing curriculum'.¹⁸² In the project in Pakistan, teachers' role was primarily that of being based at the NGO receiving messages from learners; the extent and kind of response provided by teachers is not documented. Teachers in the Pakistan project were trained to use the mobile phone by itself and in combination with a computer. Specific teacher training was given on how to type in the Urdu language. In the Niger project, the ability of teachers to cope with new material was limited by their lack of digital skills; it was also difficult to find literate women above 25 who could teach the literacy classes, and in some communities it was culturally inappropriate for male teachers to teach female students. On the other hand, teachers from outside of the village were more often absent or were absent for longer than strictly necessary. In some villages, the quality of teachers was low, which undermined the effectiveness of the mobile phone component. In consequence, the project relied on community members selected and trained in adult education methodology by the Ministry of Non-Formal Education. During the second year, the selection of teachers was much more stringent, and more time was allocated towards training teachers on using the mobile phone.

181 UNESCO, 2013a.

182 *ibid*

Outcomes – A rapid literacy transition with mobile phones, a short-lived experience?

Reflecting UNESCO's 1958 literacy definition, evaluation mechanisms used by all three projects were based on measuring literacy as basic skills before and after the intervention, with positive acquisition results reported across the three projects. In Afghanistan, pre-programme tests showed that students overestimated their literacy ('students were barely able to recognize their letters'). The tests were not designed to measure precise knowledge of certain letters or words, but to measure the students' ability to read questions, follow directions and formulate sentences in response. The main outcome of the Afghan case was that students made rapid progress in transitioning to a literacy course level in only four months that without the mobile component would have taken them nine months. 'By the end of the four months mobile literacy course, 83 per cent of the mobile literacy students were able to complete the post-test using correct sentence structure and vocabulary; (...) a small number of students left the course with the ability to read and understand magazines and newspapers'.¹⁸³ Students also used the acquired digital skills to send texts to classmates that allowed for communication beyond the educational scope. This extended into the families of the students, as noted by students who commented that their mothers were now able to communicate via mobile phone based on training by their daughters. Most of the above outcomes are attributed to reading and writing being linked 'to a new and exciting form of daily communication, such that the students could immediately see the results of their learning and be further motivated to maintain and expand their skills'.¹⁸⁴ With no dropout from the 50 participants during the Afghan project's duration, a quantitative increase in girls and families interested in participating in the project was documented in the number of names on a waiting list. Enhanced communication and security was also reported as a social benefit of enabling communication between young people and especially women who were restricted in terms of when and where they could go outside of the home.

The project in Pakistan was also evaluated by a higher education institution. The evaluation¹⁸⁵ reports that monthly examinations were given to learners at the learning centers located in their community. Score ranges were used A (100-70), B (69-50), and C (50-0). In addition to the monthly examinations, a pre and post evaluation of the learners' literacy skills also took place. This included showing participants pictures of different objects and asking them to write the corresponding names on a sheet of paper.

After four months of training in the first phase, participants were documented to show improvement in literacy skills when writing the names of objects, as well as in confidence and enthusiasm for using mobile phones to learn literacy skills. In

183 *ibid*

184 *ibid*

185 Malik, R., 2010.

a second phase of the project, learners were able to learn basic numeracy skills to solve basic math problems/money problems and to read written documents in Urdu. With no students dropping out, the evaluation reported stronger community networks and an increased awareness among parents of the importance of sending their girls to school.¹⁸⁶ The evaluation did not ascertain how long the acquired literacy skills were retained.

In the Niger project, a randomized control trial¹⁸⁷ measured change in participants' literacy and numeracy pre and post-test scores. On average, test scores in villages that incorporated the mobile literacy component were 13 per cent higher for writing and 8 per cent higher for math than in the villages that received traditional literacy classes with no mobile phone intervention.¹⁸⁸ These differences were statistically significant as measured immediately at the end of the programme. However, despite initial gains, both groups experienced depreciation of achieved skills seven months after the end of classes. There was a relatively weaker drop in math skills compared to writing skills. Depreciation of skills was smaller for students who participated in the mobile phone component yet for those who were at the upper end of the distribution with higher test scores in writing or math. As literacy classes using the mobile phone component had been disaggregated by sex, it was possible to note in this regard that 'there were relatively equal effects on men and women, young and old. Women's test scores were relatively lower at the outset and also after the programme'.¹⁸⁹

■ Enhancing Existing Community Empowerment Programmes – Functional Literacy

Two projects, in Senegal and Somalia, were embedded in existing community-based empowerment programmes with emphasis on literacy as enhancing functional skills. In Senegal, a Community Empowerment Programme (CEP) was designed and implemented by an international NGO known for working since the 1970s in non-formal education in Africa using African traditions and learning methods. A global non-profit organization based in the United States implemented a youth livelihoods programme in Somalia, which aimed to build young people's employment skills.

186 Ibid; noted as well in Miyazawa, I. 2009.

187 Aker, J.; Ksoll, C.; and Lybbert, T. 2011; Aker, J., Ksoll, C. and Lybbert, T. 2012; UNESCO, 2013e.

188 This translated into 0.19-0.2 standard deviations higher scores in writing and 0.25-0.26 standard deviations higher scores in math.

189 UNESCO, 2013e.

Content and pedagogy: Functional skills practised via SMS/ audio

The curricular content and pedagogy of the programmes in Senegal and Somalia followed processes similar to those of the projects mentioned above, with learners' interaction based on SMS exchange. Literacy skills acquired via texting, with curricular content provided by the community-based programmes, held the potential to become functional in each participant's immediate context. But the projects varied in the extent to which acquired skills were applied to an immediate context, as part of the mobile learning intervention or as a consequence that can be attributed to it.

In the Senegal project, the CEP programme has two components, each lasting 15 months. One addresses human rights, such as the rights to health, bodily integrity and participation. The other addresses functional literacy, with participants learning to read and write in their own language, gain basic numeracy skills, tackle problem-solving and learn management basics.¹⁹⁰ The mobile literacy component, known as the Jokko Initiative, was not created to replace classroom literacy learning but to enhance it, by giving participants the opportunity to practice their skills in a culturally relevant, useful and appealing way.¹⁹¹

Classes were held two to three times a week, for an average of just under three hours. Participants determine class times by reaching a consensus that best accommodates varying schedules. This flexible approach is especially important for women, who must often be home to cook family meals.

In each of 200 villages involved in the Senegal project, the NGO's local trainers facilitated approximately 25 sessions on mobile phone literacy and the potential of mobile technology for community development. Classes of 50 participants on average were taught the practical uses of standard mobile phone functions, such as sending and receiving text messages, storing and retrieving contact information, and using 'extras' such as reminders or the flashlight. Several exercises required participants to use their new literacy skills to read and write SMS texts or to navigate their phone's menu.

As in the Morocco project, the Senegal mobile phone literacy component made use of visual literacy skills to make up for participants' low literacy levels: the mobile phone menu was presented with the analogy of a mango tree, and participants visualised reaching a specific target, such as a contact's name, by moving up the trunk of the mango tree, selecting a branch, moving along the branch, and finally picking a mango. This helped participants to transition from the concrete (following branches on a real tree to pick a mango) to the semi-concrete (on a diagram of a tree on a classroom wall), to the abstract (the mobile phone's menu and its functions). The pedagogical tools used mainly complemented 'traditional'

¹⁹⁰ UNESCO, 2013h.

¹⁹¹ *ibid*

literacy tools such as blackboard, chalk and flipcharts. Drawings and posters were developed during a participatory research phase in South Senegal during summer 2008, such as a 'mobile phone poster' that allowed trainers to draw what happened on the screen of their phone when they touched a button.

A subsequent phase of mobile phone literacy included implementing an SMS service called RapidForum¹⁹² in local languages. The service reached 30 communities that also received the mobile phone literacy classes, as well as populations that had not participated in the CEP and/or had not received RapidForum SMS training. RapidForum allowed any community member to disseminate information to a network of peers (the other users of the service) by sending a single text message to a paying number. This mechanism provided a platform for exchanging a range of information and broadcasting ideas; for organizing local advocacy work, community activities and events, such as vaccination campaigns and group meetings; and in spreading news about traditional celebrations, such as baptisms, weddings or funerals.

In the Somalia project, a mobile phone financial literacy component was provided to support the Somali youth livelihood programme. Along the enhancement of digital skills, this component was aimed to build basic money management skills among youth and particularly young women, so that they could make informed decisions about their personal, household and/or small business finances. The mobile phone component combined the region's oral literacy tradition of educational storytelling with new terms related to financial management, in a series of 40 audio clips. Through touch-tone keypad menus, young people tested their knowledge of financial concepts using mobile text and audio services (interactive audio instruction, or IAI, involved an interactive audio library)¹⁹³. Participants were taught how to use mobiles for learning, for creating social and professional connections, for expanding general knowledge and for accessing information. Additional customized mobile software components were integrated, including touch-tone audio quizzes and SMS-based listenership tracking tools, accessed via a toll-free hotline. These were used to track and test listeners' knowledge with quizzes that prompted youth to answer questions about the day's lesson via their phone's keypad. Correct responses were greeted by applause, and incorrect responses led to prompts to 'try again' or receive additional instruction as necessary. Interactive financial literacy mobile services were rolled out later on in the project, testing knowledge of key concepts and getting real-time feedback.

192 RapidForum developed by UNICEF.

193 Central office recorded and uploaded short segments of audio content to a central database. Once the financial literacy-focused Somali-language audio lessons were recorded and uploaded in a central database, they were then distributed to Somali Youth Livelihoods Programme (SYLP) groups across a wide geographic expanse via MP3-enabled devices.

Teachers – from the community/for the community and peer-to-peer to tracking roles

In contrast with the projects reviewed above, in the project in Senegal and to some extent in that of Somalia, teachers/facilitators participated more actively not only in the learners' process but also in implementing the project.

The Senegal project's participatory, community-based approach teamed project staff with local field trainers to organize village-based workshops and test-training. These trainers also introduced the mobile phone literacy component to participants, at community meetings where the objectives of the project were presented along a timeline. The mobile phones used for training were then presented to the village chief and the local imam so they could publicly demonstrate their agreement with the project's rules for use of practice phones.¹⁹⁴

Some learners excelled, but others struggled with the mobile functions. Adolescents learned the quickest and engaged most in the project. The dynamics of classes started to change, with young people replicating the programme among themselves. Adolescent girls took the time to explain mobile navigation to older women participants. Not only did this ease the burden of the facilitator, who had to accommodate multiple skill sets and levels, but it also gave young people a sense of empowerment and importance. Young people also branched out to teach other family and community members who had not participated in the project.

By contrast, the project in Somalia relied heavily on a one-way, delayed-delivery interaction, with youth accessing via their mobile phones a database of audio information. Staff participation was limited to designing content and tracking learners' access to the system, including responses to quizzes. At a later stage, an interactive real-time component was initiated, but there is no reporting on this.¹⁹⁵

Outcomes – Literacy skills improved, but how functional in context? Communication and retention of concepts

An external institution evaluated the Senegal project,¹⁹⁶ while the Somalia project was evaluated by organization that implemented it.¹⁹⁷ Both evaluations used mostly quantitative measurements of literacy levels before and after the intervention, along the lines of UNESCO's literacy definition of 1958. The evaluations showed that further application of acquired functional literacy skills via SMS and/or audio mobile phone mechanisms remained primarily at a communication level in Senegal, with some improvement in literacy, and at an initial retention level of financial literacy concepts in the Somali case.

194 It was clearly explained to the community that after completion of the project the phones would be donated to the community committee or collected by the project.

195 As documented in UNESCO, 2013h.

196 Center for Effective Global Action (CEGA), University of California.

197 Education Development Center

In Senegal, the evaluation involved a pilot study in 15 communities where the NGO had implemented its CEP programme, including the mobile phone literacy classes and the RapidForum SMS system. A baseline survey took place after the first four months of literacy training and at the beginning of the mobile phone training. The baseline survey covered demographics (age, gender, education, income, and employment); mobile phone usage; literacy and numeracy; and social networks. A literacy test asked people to link two pictures to the appropriate word, to read two sentences, and to read a paragraph and answer questions about it. The numeracy test asked people to read three numbers and to do four simple arithmetic problems.

In terms of literacy, only 8.5 per cent of female respondents in the baseline survey reported being able to read text messages received, which increased to 63 per cent at the follow-up. The number of participants able to use a mobile phone rose by 40 percent, the number of participants able to read the text messages they received rose by 60 per cent, and the number of messages sent and received rose by 400 per cent. Text messages were mainly sent to community members, friends and family about community events as well as financial and medical problems.

The evaluation also examined message content and how this was used by RapidForum members, although 36 percent of the users were not part of the CEP and 55 percent were not trained to use RapidForum. Of the RapidForum participants, 86 per cent were men, possibly because of higher existing rates of literacy and mobile phone ownership among men than among women. Results showed that CEP participants tended to use the system more frequently while attending the CEP. Once the CEP was over, community messages dropped significantly; the system also experienced a breakdown after classes finished, which may have lowered participant use. As with the CEP mobile phone literacy component, RapidForum messages were mainly sent to spread information about village cleaning, social mobilization activities, community meetings, health events and distributions, and even informally unwanted practices of female genital cutting. The RapidForum evaluation did not look at differences in literacy levels between participants and non-participants.

Participants, especially women, expressed a sense of empowerment, in addition to improved literacy, after having completed the mobile phone literacy training. Women seemed to feel a new sense of appreciation from community members, family members and partners after learning how to manage mobile phones. The CEP led to increased communication among members of the community, and increased confidence and participation of women in all areas of community life. Increased communication is also another positive outcome possibly resulting from the CEP. As one participant explained during an interview, 'We [women] never used to talk about things. Now we get together and discuss our concerns. We speak up in meetings with men. We are a lot more open now with each other'.¹⁹⁸

198 UNESCO, 2013h.

It is difficult to determine, however, how much of such an outcome can be attributed to the mobile phone literacy intervention itself, and how much to the overall CEP programme: becoming literate 'goes beyond acquiring skills and strategies for working with print. It also refers to the ability to interpret social systems relevant to a particular community. As a result, there are clear limitations to the quantitative literacy testing used [...] to assess the role of the [mobile phone literacy component] on literacy skills of its participants'.¹⁹⁹

In the Somalia project, which demonstrated an ample understanding of functional literacy, encompassing financial literacy skills, an evaluation was undertaken towards the end of the project's lifespan.²⁰⁰ This aimed to identify improvements in participants' attitudes or knowledge (e.g. budgeting, saving money for emergency expenses, planning finances to reach long-term financial goals); attention was given to participants' ability to apply their knowledge of these financial concepts to real-life situations.

The evaluation showed a statistically significant improvement in test scores, for both the attitudinal and knowledge-based questions. The concepts in which youth demonstrated the most knowledge improvement were 'saving money' and 'establishing and reaching financial goals'. Youth also demonstrated some (albeit lesser) improvement in their understanding of budgeting to manage one's finances. Most youth were able to: correctly identify liability vs. asset; calculate personal net worth; define 'debt' and 'asset'; and identify a long-term financial goal. It must be noted that although attitude and knowledge-based questions were used as part of test scores, these may still not show the application of financial concepts to real-life situations.

One limitation of the evaluation was that of 762 youth who took the pre-test, only 340 took the post-test, because of dropout; another was that the evaluation did not compare participants' progress with that of a control group. With regard to the project's impact on women, no instrument of measurement was used, but project staff at an anecdotal level reiterated that the use of mobile technology was significantly beneficial for girls and youth women.²⁰¹

■ Enhancing Livelihoods – Literacy within Continuous Learning and Empowerment

Three projects implemented in non-formal and informal education contexts – in Cambodia, India (Theni District, Tamil Nadu) and Morocco– were directly linked to frameworks that aimed to empower women by improving their livelihoods and increasing their voice and participation (challenging existing social relations in the

199 *ibid*

200 EDC and Somali Centre for Empowerment. 2011. Somali Youth Livelihood Program Shaqodoon. Final Technical Report. <http://www.socwe.org/file/40.pdf>

201 UNESCO, 2013g.

process). The projects aimed to bring about change beyond the individual level, in a wider socio-economic and cultural context with educational, economic and social benefits for women.

Mobile phone enhanced literacy and digital skills were referred to as ‘domestication of technology’ in the India project and ‘reducing the mobile utility gap’ in the Morocco project. Both projects used social-anthropological research methods to examine a gender dimension in the use of mobile phones as part of a learning process within a conception of lifelong learning: ‘Learning should take place in the context of the entire social and economic value chain of rural society’.²⁰²

Literacy is not a precondition for women to be able to more actively engage in learning processes related to their livelihoods, such as goat-rearing in the India project and natural/water resource management in the Morocco project. Rather, literacy processes or practices can develop indirectly or in the background of continuous learning linked to livelihoods – supported, in these cases, by mobile phones, oral or visual literacies, self-directed learning and collective learning. In the Cambodia project, it was empowerment through increased decision-making that had the potential to be further increased, rather than livelihoods.

Mobile learning and women’s goat-rearing enterprise

The project in the Theni District, Tamil Nadu, India, included an ICT-based initiative using mobile phones for lifelong learning for women farmers, in close collaboration with an NGO that has a federation of 239 women’s self-help groups (SHG). Learning in this project was envisioned as involving two axes: a vertical flow of knowledge from knowledge institutions to the community, and a horizontal transfer of knowledge within the community. The project, as part of a case study, targeted 320 illiterate and semi-literate women farmers who expressed interest in goat-rearing with the expectation that if women were provided credit to start up small enterprises in goat- and sheep-rearing, formal training and the resultant self-directed learning would enable these women to run viable enterprises and repay credit.^{203 204}

Pedagogy – a collective learning process

- Over the course of a year, the NGO trained the women to conduct a value-chain analysis, including business feasibility studies for goat-rearing enterprises, with credit plans. The women also learned negotiation skills with various stakeholders. Based on their proposed business plans, women obtained credit (from a public-sector commercial bank) to buy nine female goats, one buck, and one mobile phone.

202 Alluri, K., Balasubramanian, K., and Kamaraj, K. 2008 in Balasubramanian, K., et al., 2010.

203 Balasubramanian, K., et al. 2010.

204 Commonwealth of Learning, 2011.

- The NGO and the federation of women conducted face-to-face training on how to use the mobile phone.
- As part of a vertical transfer of knowledge, every day three to five messages were sent to participants in the programme through the mobile phones. Nearly 500 audio messages of about 60 seconds each addressed topics including buying the goats, feed management, disease and health management, and marketing management. The Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) advised on this content, which was integrated with indigenous knowledge and contextualized to suit the local culture
- As part of a horizontal knowledge exchange and self-directed and collective learning, women were advised to use their mobile phones to discuss their enterprises among themselves.²⁰⁵ Once a week, the women met at SHG meetings and shared their experiences. They also sought help from others within the family: spouses were the primary source, followed by daughters – children or teens. 'In the domestic context most of the respondents' families supported the learning objectives of the woman. If family members hear the voicemail or audio messages, they immediately share the information with the woman and help them to learn the content. Likewise, the woman shares the content on goat-rearing with her husband and with other members of the family. This process benefits the entire family to learn new things and expand the knowledge base on goat-rearing'.²⁰⁶
- Inquiry-based learning: Women preferred to receive the messages while walking to graze animals, tending the goats or doing household chores. This was followed by women's writing in diaries with enquiry and reflection about the content received. 'Whatever stays in their minds is recorded in their diaries. The literate and semi-literate sought help from spouses and children to write the [diary] notes. The notes are discussed during the monthly SHG meetings. (..) it was felt that recalling, recording, and discussing would help to internalize the process'.²⁰⁷ Discussion and verification of the information received through the messages reflects inquiry-based learning. 'Enquiry and introspection are essential for providing the confidence to the learners to convert the messages into actions for better goat-rearing'.²⁰⁸

In addition to giving considerable attention to the quality of the content exchanged via the mobile phones, the project also trained the women in effective mobile phone conversation.²⁰⁹ 'The women felt that effective and crisp conversation ability is required since the price they pay for a call depends on the time taken in conversation'.²¹⁰

205 The cost for mobile phone services was negotiated by the Federation of women with a mobile service agency which agreed to reduce the cost among the participants.

206 Ibid:201

207 Ibid:202

208 Ibid: 205

209 Baker, D., 2006.

210 Balasubramanian, K., et al. 2010, pg. 204.

Mobile learning and women's participation in a water resource management system²¹¹

The project in Morocco, initially part of an ethnographic research study,²¹² targeted non-literate and semi-literate Berber women aged 18 to 80 in the Ait Baamrane region.²¹³ These women's daily lives and livelihoods were positively changed when they became active participants in an ICT-enabled water reporting system, called the Fog Phone. The system included the use of mobile phones to enable the women to manage a plumbing network that primarily uses harvested fog-water, supplemented by closed well water or purchased water. This water system helped to spare the women from long trips to fetch water from open wells that bring the risk of pathogens and other micro-organisms. The Berber women, from an oral-based community, had been using mobile phones with self-learned strategies for six to ten years for voice communication,²¹⁴ but due to low literacy levels they could not use SMS texting to its full potential.²¹⁵ Many of the women indicated that they were also innumerate.

The project involved four pilot stages.

Stage 1 aimed to understand the Berber women's existing mobile phone practices. Ethnographic observations and open-ended deep interviews were carried out with nineteen women who gathered at an argan oil cooperative.

In **Stage 2**, at the request of the women, ten mobile phone use workshops were held. The workshops were based on observations and data about women's phone use and the obstacles they encountered, and tailored to women's specific interests including how to use text-based features. Seven to twelve cooperative members participated in each of the workshops, which could go as long as three hours each and took place during the cooperative's operating hours. Participants were occasionally offered compensation in the form of SMS recharges valued at 10 dirham (about US\$1.20) for 100 SMS messages.

Informal self-directed and collective learning – Visually navigating from oral to written language and script

The Berber community involved in the Morocco project is part of an intricate language environment with two spoken languages, (Berber and spoken Moroccan Arabic); two State languages (Modern Standard Arabic and French); three scripts (Arabic script, Roman alphabet and Tifinagh script for written Berber) and two numbering systems (Arabic and Arabic-Indic). Language diversity, in oral and

211 This section draws considerably from Dodson, L., 2014.

212 Dodson, L., 2014.

213 Ibid; in this region rural villages share a similar population; in many cases they are sisters, cousins or relatives of each other.

214 Ibid; approximately one-third of the respondents reported that they occasionally made a phone call related to work, such as conducting private sales of Argan oil or informing a colleague they would be late for work.

215 This is the so-called mobile utility gap.

written forms, is a challenge for mobile phone learners with low literacy skills, who often struggle to master keypads and phone menus.

As in the project in Theni District, India, women in the Morocco project used self-directed learning and collective strategies to use the mobile phone, including a high degree of visual literacy to provide meaning to letters and numbers and to memorize keypad sequences and phone numbers.

In the Berber community project, women 'stored phone numbers in small phonebooks – literally scraps of paper – and memorized the location of important numbers on those surfaces. Some users recounted that they memorized a few digits of a phone number and trolled through call logs to identify the sequence before making a call. Most participants did not use text-based features such as phonebooks or SMS: 85% of women reported that they could not independently write, read or send an SMS message. (...) Some semi-literate women reported being able to read portions of incoming texts, but found it difficult to craft and send responses. No participant reported using voicemail'.²¹⁶

Women collectively captured the meaning of letters and numbers on their phone with the help of proximate literates. 'Women reported that they give their phone to others to install calling credits, they rely on children to programme their contact list, they seek out trusted contacts to read and write text messages, and they have others dial and answer calls for them'.²¹⁷

What motivates women to learn?

In the Berber community project, women's main motivation to learn how to use SMS texting was to maintain and expand social connections. Workshop participants asked to learn the Roman alphabet as opposed to Arabic or Berber script, because the former would help them get the greatest use out of their mobile phones. The potential to save money by sending a text messages was also an incentive: making a phone call in Morocco can be five times more expensive than sending an SMS. A number of women reported that they wanted to improve their mobile phone skills in order to increase their privacy and independence. As one cooperative member stated, 'I don't go out much, so sending messages is appealing. It's private. When you give your mobile to someone to send a message for you, you are giving them your privacy.'²¹⁸ They also requested lessons on how to install pre-paid calling credits from a scratch-card – a skill that would give them more privacy and independence.²¹⁹

216 Dodson, L., et al., 2013.

217 Dodson, L., 2014 and Dodson, L., et al. 2013.

218 Dodson, L., 2014.

219 *ibid*

Learning to initially write – SMS

During the workshops, women learned and practised identifying letters on phone keypads and on a chalkboard; they learned to write names in their phone contact list and in the SMS message field. Participants also learned to write their names on a chalkboard using their stored name in the phone as a reference guide. To support the use of SMS, participants devised a list of short, simple, relevant, easy-to-understand SMS messages that included Berber-language phrases for ‘call me,’ ‘come home now’ or ‘send a *tAabiya* (calling credit). The project researcher created individual paper-based SMS message workbooks that contained the sample messages written in Roman letters. Users were encouraged to consult these books to practice sending texts to each other and to the researcher.²²⁰

Co-learning and co-teaching

Just as collective learning strategies were used among friends and family in the project in Theni District, Tamil Nadu, India, during the workshops in the Moroccan project, women created informal learning circles to share the process of using text-based features to learn numbers and letters. Co-learning and co-teaching extended to mobile phone repair skills that had an immediate impact on the women’s ability to use their phones. Women were able to gain confidence by experimenting with technology and practising the skills they wanted to learn.

Based on further qualitative interviews and observations, and building on stages 1 and 2, **stage 3** and **stage 4**²²¹ of the Morocco project involved a participatory stakeholder design of the Fog Phone, an information system for reporting problems such as leaks within the fog-water distribution system. In addition, this system also allowed the NGO to send periodic bulk SMS messages to notify water users of temporary service interruptions, water-related health alerts, sanitation advice or conservation reminders.

The water reporting structure linked the NGO responsible for the fog-water management system, male project managers and female water users. In a traditional male-dominated environment, the goal was for women to participate and assume leadership of a technology-enabled water management system. This system would help users quickly and efficiently relay information about water problems or service requests to project managers who could then track repairs to keep the system functioning. The water project’s operation depends upon timely and accurate communication exchange. However, as will be discussed in the following outcomes section, this communication is hindered by traditional gender dynamics that do not allow males and females to communicate directly.

220 *ibid*

221 *ibid*

Water reporting syntax – visual literacy

In the context of the water management reporting system, participants had difficulty using mobile phones, including texting. The Fog Phone system required using mobile keypad letters and numbers and matching pictures to mobile keypad letters and numbers. However, due to prior observations on women's self-learned strategies using their mobile phones during the Argan Coop workshops and pilot participatory designs of the Fog Phone, the project identified a water reporting syntax familiar to women in the community. As in the Senegal project that relied on the image of mango tree as a metaphoric guide to navigate through the mobile phone features, the Fog Phone system relied on women connecting poster photographs on four common water issues to a letter corresponding to a number on a mobile phone keypad. Each house was assigned a water meter number so service requests could be identified by number rather than a name or phone number. Each water issue on the poster had an explanation in Tashelhit (the local Berber dialect) written in both Arabic and Latin script next to the image and the keypad design. The poster instructed water users to send a text to the Fog Phone indicating the water meter number and the water report. Each incoming SMS message started with a letter assigned to a water problem followed by a unique number assigned to each meter. Messages exchanged revolved around water problems as well as non water-related social topics.

Mobile learning as information transfer for decision-making

In the Cambodia project, the mobile phone component was envisioned to complement an existing Women's Economic Empowerment Programme, as described above. In particular, the mobile phone component aimed 'to promote female counsellors' leadership skills to better serve community members'.²²² But the mobile phones were reportedly given to beneficiaries as 'a way to improve communication and coordination' by enabling women to receive information on agriculture, market prices and disaster-preparedness, to share knowledge and to report emergencies and domestic violence.²²³

The delivery of information approach as the purpose of the project limited the potential learning experience of the forty-five Female Commune Counsellors (FCCs) and seven women producers who participated in the mobile phone component. The component focused on learning how to use the mobile phone. 'Less than half of the initial batch of beneficiaries was able to reply by SMS; the rest were forced to call to relay their message. Yet in due time women were able to master their phones'.²²⁴ In this regard, it can be inferred that the literacy levels of the women involved were low but not an obstacle to learning how to use SMS texting²²⁵,

222 UNESCO, 2013c.

223 *ibid*

224 *ibid*

225 *ibid*

despite one of the project's collected testimonies noting participants as having a grade 2 of primary education. An SMS aggregation/disaggregation system gave the women access to information such as weather forecasts, market prices, farming tips and health advisories. However, this system appeared to remain a unidirectional transfer of information: 'The organizers collected information and sent them as messages but it was up to the beneficiaries how to use them to their advantage'.²²⁶

Role of teachers is diminished in self-directed learning and collective learning

In the above three projects (Cambodia, India (Theni District, Tamil Nadu) and Morocco) the role of teachers or facilitators in the mobile phone learning process is not evident. In the India and Morocco projects,²²⁷ this may be because they were set in non-formal and informal education settings in which self-directed learning and collective learning (with family and peers) prevailed. But it is clear the women in both projects did receive training – to prepare business plans in the India project, and to use mobile phones in both projects. Training in the India project came from project staff and members of the federation of women involving self-help groups; in Morocco, project staff were involved in teaching women how to use mobile phones by combining text-based features with existing visual literacy strategies.

Outcomes – From silence to voice, from powerlessness to empowerment

'The transition from silence to voice, from powerlessness to empowerment is possible in non-formal learning contexts, just as it is in formal contexts, (...) technology offers a means to accelerate this process if the use of technology is placed in an appropriate social context'.²²⁸

Messages transformed in actions of livelihood and social change

In the context of a research study,²²⁹ the evaluation mechanism of the project in Theni District, Tamil Nadu, India, used a quantitative methodological approach including a structured survey conducted among 73 of the 320 participating women, as well as a qualitative one using social-anthropological tools (participatory appraisal techniques – focus groups, participatory observations and interviews).

Of the women interviewed, 82 per cent stated that mobile phone-based training is more useful and easier than face-to-face training,²³⁰ which is financially and socially inconvenient: 'Women pointed out that attending training programmes

226 ibid

227 The background case study (UNESCO, 2013c) does not refer to training or trainers as part of the project.

228 Balasubramanian, K., et al. 2010, pg. 207.

229 ibid

230 Ibid:202

involves substantial financial, economic, and social opportunity costs for them. Some lose their labour wages. They have to seek the support of other family members or neighbours in managing the household chores'.²³¹

Women were able to use mobile phones not just as communication tools but also learning and business tools, hence improving their goat-rearing practices. 'It is clear that given the appropriate opportunities, even the most marginalized women can learn effectively. Yet they learn differently. The women of VIDIVELLI [the federation of women self-help groups] are in the stages of development of procedural knowledge and development of constructed knowledge. However, the transition from silence to development of constructed knowledge has been influenced by the strong cognitive social capital developed through the learning and sharing processes'.²³²

Though the project did not deliberately document how literacy levels changed among participants, the outcomes above imply that literacy was enhanced when women were motivated to write in diaries about the messages received via SMS; this was done with the help of family and the self-help groups. 'Mobile phones are enhancing the flow of communication, especially with relatives and friends in other villages. Some of the women have learned to send cost-free SMSs through mobiles'.²³³

Women's voice and participation in their communities and households were also enhanced as part of collective agency: 'Management decisions of the assets and resources are discussed in the SHG meetings and thereby the realm of the decision-making in the household economy is moving beyond the household. Clearly, this empowerment results from women's participation in learning and in ownership of assets'.²³⁴

Social interactions facilitating or limiting mobile learning

The Morocco project assessed the impact of its intervention by undertaking 58 interviews with women aged 18 to 80, and by running two pilot tests of the Fog Phone design and implementation; in addition it examined the content of 81 SMS messages.

In setting a baseline, the interviews revealed that many of the women reported that they had little or no literacy. Women who reported that they could independently send or read a text message ranged in age from 18 to the mid-30s. All of the women under 24 were able to send SMS messages, reflecting higher literacy rates about younger women. Women who attended the project workshops 'made progress towards narrowing their personal mobile utility gap: those who had some

231 Ibid:203

232 Ibid:206

233 Ibid:206

234 Ibid:206

SMS skills improved their ability to send texts; a handful of entirely illiterate women developed the ability to write their name in their phone, on paper, and on a chalkboard'.²³⁵

Analysis of the text messages exchanged in the fog phone water reporting system showed that longer messages were sent by younger women (18-24) who had literacy skills; a minority used the fog phone protocol code with a letter indicating the water problem and the water meter; other messages had social content, such as Ramadan blessings. The number of messages decreased towards later in the project. Reasons for this were documented to include a lack of phone credits to send an SMS; inability to send SMS after the mobile network failed during a particularly strong windstorm; and a lower frequency of water problems to report on. In this context, the Morocco project does not examine further or document if women's acquired literacy skills used for texting water problems as part of the fog-phone system were retained and used for other purposes. Nevertheless, as key outcome of this project, women were indeed enabled to actively participate in a water management structure that was traditionally male dominated.

Observed barriers hindering women's use of the mobile phone within the fog phone system reflect trends in other projects reviewed in this report: participants with low literacy levels have difficulty using text messages as a communication or learning tool; complex language environments do not match standard mobile interfaces; traditional socio-cultural norms. One of the main contributions of this project is the extent to which it sheds light on the kinds of informal social controls and interactions on women's use of mobile phones.

In rural Muslim Berber areas, communication between unrelated women and men is highly limited due to conservative traditional and religious norms. Restrictions apply to face-to-face communication as well as phone-to-phone and text-to-text contact, which has implications for the design and use of mobile-based development initiatives.²³⁶ Mobile communication can host gender-proscribed communication patterns that can extend forms of surveillance on Berber women. 'It was clear that male authority figures worried about women's mobile use. Berber men expressed concern that female relatives would be tempted to use their mobiles to interact with men outside of the family, and they made oblique references that mobiles encourage infidelity by women'.²³⁷ At the same time, such surveillance does not come only from males but pervades the community with 'men and women, fathers and mothers, brothers and sisters all contributed to an atmosphere of suspicion and surveillance of women's phone use'.²³⁸

However, socio-cultural norms can affect Berber women's mobile phone use both positively and negatively. 'Due to low literacy levels, women rely on assistance

235 Dodson, L., et al. 2013.

236 Dodson, L., 2014.

237 *ibid*

238 *ibid*

from an array of trusted others to help them manage and use their phones. This reliance on a network of helpers, though, often comes at the cost of privacy and independence. This is the ‘paradox of social networks’: family, friends and acquaintances play a pivotal role in a rural Berber woman’s ability to use her phone while simultaneously exerting an oversight role over her phone use’.²³⁹

Information transfer across distance but not across decisions

The project in Cambodia monitored its progress via field visits, progress reports and case studies, including video documentation of beneficiaries’ improvement in health care, livelihood, safety and security. The project aimed to assess: 1) the percentage of women who improved their health care, livelihood, safety and security through their participation in the mobile phone component complementing the Women Economic Empowerment Programme; 2) the number of women able to operate SMS functions and disseminate information; 3) number of monitoring visits conducted (to check progress as well as ensure usefulness of project to the beneficiaries by getting their feedback).²⁴⁰

Monitoring showed that owners of the phones made full use of the phones in their daily lives, such as making calls to other council and community members, receiving current market prices of agricultural goods, and responding to other women’s needs.²⁴¹

Project monitoring also highlighted that women overcame practical communication limitations caused by geographical distance: ‘The mobile phone lessened the need for women to travel to meet other women coordinators, thus reducing security risks. The mobile phone facilitated communication and efficient information exchange. (...) Through the simple act of sending and receiving SMS, the Female Commune Counsellors (FCCs) saved time and physical effort (either by walking or cycling) to attend meetings or to speak to other female counsellors. This gave the FCCs more time to do other things, like taking care of their family, looking after their livelihood, or attending to the concerns of their community’.²⁴²

The mobile phone contribution of this project remained at an information/communication exchange level, with application of information to decision-making documented at an anecdotal level: ‘Yeung said she now has bargaining power to negotiate for higher prices for her farm produce’ (...) ‘The flooding, however, did not catch the villagers by surprise as Yeung also relayed to the village the SMS message about the impending floods and the weather warning ...’.²⁴³ The extent to which literacy levels of the female counsellors were engaged by mobile phone

239 *ibid*

240 UNESCO, 2013c.

241 C. Sophasawatsakal. 2012. Pink telephones—using technology to empower women in Cambodia. Oxfam Policy and Practice Blog as quoted in UNESCO 2013c.

242 UNESCO, 2013c.

243 *ibid*

learning is not evident, with a few testimonies only establishing that some of the participants had primary grade 2 education.

Sustainability

This section examines the extent and kind of resources that projects could count on to implement their activities, including mobile devices themselves, human resources, funding and in-kind contributions by project partners. In addition to a project's assessed impact as noted above, availability of resources helps determine whether projects are able to sustain and scale up their interventions.

■ Technological Resources: Simple Mobile Devices and SMS mechanisms

Technological infrastructure being one of the most important resources for mobile phone projects to operate has been addressed earlier as part of project local contexts. However at a project level, the kind of mobile phone technology that was used is also essential to examine.

In this regard, it is important to assess the kind of mobile phone devices that were used in the projects, who provided them and at what cost to the learners. Most projects relied on learners using simple low-cost mobile phones, with some 'feature phones' on which games could be installed (for example in the India ESL). In some projects, mobile phones were already owned by learners, though most of them were in very poor condition, such as those used by the Berber women (who bought them in the market or received them as hand-me-downs from family members). In other cases, learners initially borrowed the devices from the project, as in the project in Senegal: 10 training mobile phones per class were provided, along with 10 SIM cards. 'At the end of the programme, mobile phones and SIM cards were either distributed to a local community committee (to be used at their discretion), or collected by the NGO field staff and transferred to another CEP village receiving [the mobile phone literacy] classes (...) the [NGO] did not want to be seen as an organization handing out free mobile phones to its participants without any sort of mutual agreement on how these were going to be used'.²⁴⁴

In other projects, mobile phones were given to users for 'free' as subsidized by the private sector, as in the Cambodia project. It is important to distinguish between free phones and 'free samples' linked to private sector marketing campaigns. In Niger, going one step closer to a collective appropriation of the device, low-end, multimedia phones programmed with a digital curriculum in local languages and

244 UNESCO, 2013h.

basic SMS were also given to groups of five; each individual contributed about US\$2 to a joint fund, to be used for charging and repairs.²⁴⁵

An exceptional case is the project in Theni District, Tamil Nadu, India, involving women in goat rearing. The cost of the mobile phone was contained within the business plans prepared by the women participating in the project, who obtained funding credit from a public sector bank. The choice of mobile phones versus other ICTs was proposed by the women participating in the project, as ‘attending classes or watching multimedia restricted their movement for employment, occupation, and household chores’.²⁴⁶

It is also important to determine how learners involved in the projects were able to pay for mobile services, including phone calls and SMS. The most simple mobile phone feature in terms of cost and complexity were SMS. Across all projects, participants aimed to be able to make use of SMS for communication purposes, as this would cost less than phone calls. In the projects examined, the trend was to use a pay-as-you-go credit subsidized by the project or negotiated by it with mobile phone providers, with possibilities of obtaining bulk prices. For example, in the Cambodia project, a private communication company was engaged to provide free SIM cards and a US\$3 monthly subsidy to participating women.

Several projects relied on SMS disaggregation/aggregation systems. This necessitated a laptop and software or platform, which was usually provided by the project. In the case of Senegal, this system was documented as having a high cost for the project and hence becoming unsustainable. ‘Its design did not eliminate any costs; rather, it transferred the cost of all messages sent to the [NGO], except for the initial message, which was paid by the user. This means that the service was not financially sustainable, and that it would not be feasible for the [NGO] to cover these costs in the event of scaling up the service. Due to its high cost and lack of financial viability, RapidForum was terminated in December 2010’.²⁴⁷

A key obstacle in several of the projects was the inability of mobile phones to support the range of local languages and script. For example, the mobile phones that the Berber women used, often counterfeit, came programmed in languages that they do not read, write or speak (such as English, French and Spanish), and did not support Arabic script. Similarly, in the Cambodia project participants had difficulty navigating mobile phone features using English and Khmer script.

In all mobile phone projects that accompanied existing literacy programmes, the devices were used to enhance literacy in tandem to other pedagogical tools such as the traditional chalk and paper.

245 UNESCO, 2013e.

246 Balasubramanian, K., et al. 2010, pg. 200.

247 UNESCO, 2013h.

■ Human Resources – From the Community and External

Most of the mobile phone projects were embedded in or accompanied existing non-formal literacy and/or community empowerment programmes, implying a ‘sharing’ of human resources. Teachers would ideally be selected from the community. In the Afghanistan project, teachers involved in the mobile phone enhanced literacy component had already been teaching in the existing literacy programmes. The level of literacy and digital skills that these teachers had was high compared with that of teachers or facilitators in other projects.

In Niger, the mobile phone literacy component struggled to attract teachers who were literate themselves and who could also be trained in the digital skills required to use the mobile phone. When projects could not engage teachers already working in literacy programmes, an alternative was to identify and train teachers from among the community or from other communities.

In Niger and Pakistan, the projects also relied on community members as social mobilizers and facilitators to introduce the project to communities.

In the nine cases reviewed, project staff members were considerably involved not only in designing but also in implementing the project, in roles that included management, technical support, monitoring and translation. Project staff who had been identified from within the community had the advantage of serving as community brokers to seek support for their project.

■ Partnerships

With variation, all nine projects benefited from partnerships with external entities as well as key national and local stakeholders for project design and implementation; these partnerships, depending on the entity, imply public and private funding.²⁴⁸ Given that this review is based mostly on secondary sources, however, it is difficult to ascertain clearly how and when each partner joined each mobile phone-enhanced literacy component and/or existing literacy programme or community empowerment programme. Within these limitations, partnership trends are identified below (a detailed breakdown by international, national and local levels is shown in Table 2).

248 Some of the case studies commissioned do not address funding and are not consistent in distinguishing which project ‘partners’ are funders (and to what amounts) and which are in-kind partners and in what regard; thus it is not possible for this report to examine these factors.

International funding

Funding for mobile phone learning is primarily coming from US-based entities, through bilateral development cooperation or research funding; international private mobile sector providers are also heavily present in the funding of projects.

Higher education institutions – Foreign/Anglo-American

Among international partners, US higher education institutions prevail, supporting doctoral or faculty research and/or project implementation (Afghanistan, India ESL, Morocco); or as project evaluators (Niger, Senegal). By contrast, only two national higher education institutions participated in the projects reviewed supplying subject expertise for content disseminated via mobile phones in the project in Theni District, Tamil Nadu, India and supporting evaluation of the Pakistan project.

Weak public sector presence at national and local levels of partnerships

The involvement of national public entities was very limited in the reviewed projects.²⁴⁹ The Niger project relied on teachers selected from the community and trained in adult education methods by the Ministry of Non-Formal Education. In Pakistan, the Punjab Department of Literacy and Non-Formal Basic Education was a partner at the local level in the mobile literacy project. In Cambodia, the Ministry of Agriculture was involved with SMS content.

The mobile sector operating at national levels was reported as providing services to two projects: Afghanistan and Morocco. For other projects, this service was given by provincial mobile sector providers.

Strong partnerships with NGOs at local levels

International participation was counterbalanced by strong partnerships with NGOs at a local level. This can be due to the fact that these organizations are the door to existing community-based non-formal literacy programmes or women's empowerment programmes. Mobile phone-enhanced literacy projects embedded in existing programmes have a higher chance for success, especially when they can take advantage of existing resources, such as teachers who can facilitate mobile learning experiences (e.g. in Afghanistan).

Mobile phone learning projects embedded within NGO programmes can be risky if the programmes are fragile. From another perspective, these organizations are often accountable to the communities in which they work. For example, the NGO

²⁴⁹ One future initiative was noted for Afghanistan: the Ministry of Education of Afghanistan was committed to launch in 2012 with a private mobile phone provider, a new mobile-based literacy programme focusing on women with a low education levels and using a mobile phone device – the Mobile Teacher - using audio-video literacy lessons.

that partnered with the Berber community mobile phone project provided access to the argan oil cooperatives that brought women together in the first stages of the project; it was also responsible for designing, installing and operating the fog water harvesting and distribution system in which the mobile phone project was integrated. This NGO supported women's participation in the new water system at the community and household levels, as well as the use of ICTs to accomplish water- monitoring tasks via the fog phone. Marginalized rural communities have come to rely on this NGO for delivery of potable water. '[The NGO] has entered into a social contract with the communities participating in the fog-water project. The communities have provided land access, labour and a commitment to participate in this research on the Fog Phone as their portion of the social contract. The communities could potentially hold [the NGO] responsible for the outcome and sustainability of both the fog-water system and the water information system. (...) [the NGO] has not yet devised a detailed financial sustainability plan for the fog-water project or the accompanying Fog Phone, and therefore, risks being unprepared for system operating costs'.²⁵⁰To make up for fragile funding, this NGO's administration has occasionally committed personal funds and in-kind services to support the project (such as equipment, food and staff). Its commitment stems from deep roots in southern and southwest Morocco, combined with a mission to help rural Berber communities neglected by the government.²⁵¹

On the other hand, NGO programmes that encourage entrepreneurship and project ownership by their participants will offer a more solid base for the sustainability of mobile phone projects. The project in Theni District, India, involving women's business plans for goat rearing was funded by the participants themselves: 'The bank agreed to the proposal of the SHGs and approved an amount of Rs. 12 (nearly US\$270,000) for the programme. The credit and the legal ownership of the assets are in the names of the participating women'.²⁵²

250 Dodson, L., 2014.

251 *ibid*

252 Balasubramanian, K., et al. 2010, pg. 194

TABLE 2: Partners participating in the nine mobile phone learning projects**International Entities:**

International organizations: UNESCO (Pakistan project); UNICEF (Senegal)

Intergovernmental organization: Commonwealth of Learning (COL), Canada (Theni District, Tamil Nadu, India)

Non-governmental organizations: Oxfam Great Britain (funding partner in Cambodia); Tostan, US-registered (implementer of Senegal project); Catholic Relief Services, USA (Niger)

Bilateral development cooperation: USAID (Niger, Senegal, Somalia); Norad (Senegal project), AECID – Spain (Senegal)

Non-profit entities: Education Development Center, USA (implementer of USAID funding in Somalia); Gates Foundation, USA (Niger); Nike Foundation, USA (Senegal); Greenbaum Foundation, USA (Senegal); Creating Hope International, USA (Afghanistan); Skoll Foundation, USA (Senegal)

Higher education institutions: University of California at Berkeley & Carnegie Mellon University, USA (India ESL); Alliance for Technology, Learning and Society (ATLAS) Institute, University of Colorado at Boulder, USA (Morocco); Afghan Women's Council at Georgetown University, USA (Afghanistan); Tufts University, USA, Oxford University/The Fell Fund, United Kingdom; University of California at Davis, USA (Niger); Center for Effective Global Action (CEGA) at the University of California at Berkeley, USA (Senegal).

US national research funding: US National Science Foundation & The American Institute for Maghrib Studies (Morocco); Geraldine P. Waldorf Fund, US (Afghanistan).

Private providers of mobile and start-up services: Nokia (funding partner and mobile phone manufacturer, Cambodia and Pakistan), Metfone (Vietnamese private communication company operating in Cambodia), Frontline SMS (Cambodia and Morocco), Open Messenger (Cambodia); Mobilink (Pakistan); Soutkel, USA (Somalia); Citris, USA (Niger).

National entities:

National public education: Ministry of Non-Formal Education (Niger); Ministry of Agriculture (Cambodia).

Mobile private sector: National network provider (Morocco); Afghan Telecommunication (Afghanistan).

Provincial and local entities:

Provincial/local public education: Punjab Department of Literacy and Non-Formal Basic Education (Pakistan).

Non-governmental organizations: Vidiyal including VIDIVELLI Federation of 239 women self-help groups (SHGs) dedicated to goat and sheep enterprise (Theni District, Tamil Nadu, India); Women for Prosperity (Cambodia); Bunyad Literacy Community Council (Pakistan); Bunyad Foundation (Pakistan); Agahi and Dhaka Ahsania Mission Pakistan (Pakistan); the Afghan Institute of Learning (Afghanistan); '50 local NGOs' (Somalia); Dar Si-Hmad for Development, Education and Culture (Morocco); Argan Oil Cooperative (Morocco).

Higher education institutions: Tamil Nadu Veterinary and Animal Sciences University (Theni District, Tamil Nadu, India); Gender Studies Department, University of Punjab (Pakistan).

Regional mobile sector providers: IKSL-Airtel Group (Theni District, Tamil Nadu, India); Mobilink Islamabad (Pakistan).

Participatory needs assessment and project implementation with the community: Giving meaning to the mobile phone

Four of the projects engaged the targeted community in a participatory needs assessment as a way to best tailor the project. This approach allowed for the varied educational and livelihood needs and strengths – as well as socio-cultural factors including linguistic diversity – to be addressed in project design. Most evident examples of this include the mobile phone projects that partnered closely with local NGOs running non-formal literacy projects and community empowerment programmes. The community was also involved in project management and implementation.

For example, in the project in the Theni District, Tamil Nadu, India, the partnering and implementing NGO Vidiyal – which includes the VIDIVELLI Federation of 239 women self-help groups (SHGs) dedicated to goat and sheep enterprise – carried out participatory rural appraisals for a learning needs analysis among the participating women. Management and marketing decisions were also taken jointly with participating women through their monthly SHG meetings. These meetings and decisions also included how to partner with a local mobile services provider: 'Vidiyal in agreement with IKSLL-Airtel Group, sent audio messages and voicemails to the 300 women through mobile phones. This was based on 'The mobile phone dealers and mobile service companies being invited to the meetings during which the SHG members negotiated the terms, prices and service mechanisms'.²⁵³

In Senegal, the NGO carried out a participatory needs assessment process in Casamance, in southern Senegal, to gather information on mobile phone usage in rural areas and to engage individuals and groups in creating a relevant training module on mobile literacy. The team engaged participants with new pedagogical techniques during test-training sessions, and later refined these techniques based on participant feedback.

The project in Pakistan used a community sensitization component that helped gain support from community members.²⁵⁴ Social mobilisers conducted regular meetings with community leaders to share progress of the project. Even teachers and learners who were to participate in the project were selected with consent of the community.

The Morocco project, following an ethnographic participatory approach, was improved on the basis of feedback from the women participants, including their detailed responses to interviews. The project in Theni District, Tamil Nadu, India, also relied on qualitative participatory appraisals to obtain women's feedback. In this case, the women were the ones who decided that it was better to use mobile phones rather than other ICTs: 'Most of the women, as poor labourers, felt that attending classes or watching multimedia materials restricted their movement for employment, occupation, and household chores. They asked Vidiyal and COL to look into the possibility of using the mobile phones as a business and learning tool'.²⁵⁵

253 Balasubramanian, K., et al. 2010, pg. 200.

254 UNESCO, 2013b.

255 Balasubramanian, K., et al. 2010, pg. 200.



Part IV:

Challenges and Solutions

The nine mobile phone learning projects reviewed by this report encountered common obstacles in their aim to enhance literacy and empowerment in women and girls. This section uses examples to examine those challenges as well as solutions that were found to alleviate or overcome them.

■ Challenge 1: Ensuring access to mobile phones: cost and connectivity

Participants in all projects encountered difficulties in accessing and using mobile phones. Low-income families struggle to afford a mobile phone and to keep up with subscription payments. In addition, network connectivity for mobile devices is often lacking or weak in rural areas. '[E]vidence is growing that private, competitive market provision does not always provide last mile access to every subscriber, mainly due to the higher marginal costs of providing access to remote users.' Costs increase dramatically for connecting the last subscribers, threatening the commercial viability of serving remote areas such as those in rural areas'.²⁵⁶ Women's access to mobile phones was also restricted by low literacy levels, lack of digital skills, and socio-cultural norms and practices.

Users meeting mobile phone costs

Albeit temporary, short-term solutions to the challenge of cost included users bearing the cost for the phone device from any possible available income, and the project lending phones to users for the duration of the activities. Other alternatives included providing mobile phones and services to users/learners either at no cost or at affordable prices through temporary agreements with private providers; in Cambodia and Senegal, for example, subsidies or bulk prices for SIM cards were negotiated with private providers.

In Senegal, however, when the cost of the SMS aggregation/disaggregation system was transferred to the implementing NGO, it became unsustainable, and the service was terminated as part of the project.²⁵⁷ In the Morocco project, if female water problem reporters were required to bear the cost of regular (daily or weekly) reporting, resulting charges could further strain their available income. An alternative proposed by the project would be for the NGO to absorb calling costs by creating a toll-free phone number in partnership with a mobile carrier,²⁵⁸ but this would only be sustainable if it fitted within the NGO's budget.

These experiences show that projects must consider how participants will keep up with mobile phone costs once the project finishes and support mechanisms such

256 ITU-UNESCO, 2013a with reference to ITU 'World Telecommunication Development Report 2002: Reinventing Telecoms' and the ICT Regulation handbook, Chapter 5 dealing with Universal Access and Service.

257 UNESCO, 2013h.

258 Dodson, L., 2014.

as subsidies are removed. It is worth exploring how to strengthen existing individual or communal ways of owning and using mobile phones for communication and educational purposes. One notable example is the way women in the goat-rearing project in Theni District, Tamil Nadu, India, addressed the cost of mobile phones in the business plans that they prepared and presented to a public sector bank to obtain credit.

Community-based solutions for charging and repair

Projects often relied on communities' entrepreneurial ideas to meet needs for phone charging and repair, such as setting up mobile repair centres and solar-based mobile phone charging centres (Cambodia and Niger). In Niger, 'phones were charged in the local market, with one generator charging up to 100 mobile phones at one time. In other villages, an entrepreneur had set up a calling booth and also charged mobile phones for a fee. A third method within villages was to use the battery compartment from broken radios, attach the cables to the mobile phone and use batteries as a source of energy. Another approach was for households to travel to the mobile phone base station to charge their phones there'.²⁵⁹

SMS: Affordable and effective, within limits

Sending and receiving SMS messages was the most frequently used and affordable mechanism across all projects to deliver content and/or information to participants and to interact with them. Most projects relied heavily on sending participants regular messages that would prompt them to respond (in real time or later) to questions via SMS. This mechanism reinforced participants' literacy skills by allowing them to repeatedly practice skills acquired in existing non-formal literacy programmes. The reach and effectiveness of SMS information exchange should not be overestimated, however. It makes possible the beginning of a learning experience, but the projects reviewed did not clearly establish or document how information was used and interacted upon, except in where mobile phone use was grafted on to experiences of livelihoods (e.g. in Theni District, Tamil Nadu, India, and in Morocco).

Sharing mobile phones reduces costs and increases cooperative learning

Low-income families and households often share mobile phones to reduce costs. Men often dominate ownership and/or use, but this is not always the case. For example, in the Theni District project in India, where men might have been expected to own or control phones, 'a substantial number of women involved kept the phone in their custody. (...) The spouses are also the major users of the

²⁵⁹ UNESCO, 2013e.

phone.²⁶⁰ In other words, who owns the phone and/or pays for the subscription, should not necessarily lead to conclusions of inequality or draw attention away from the advantages that sharing mobile phones can bring to non-formal or formal learning processes. Sharing implies social interdependence, which leads learners or groups to interact and cooperate around shared problems or learning activities relevant to their lives and communities.

Another proposed way of counteracting difficulties in women's mobile phone access and ownership is to facilitate such access at community-based sites. If literacy instruction is given at these centres, supported by mobile phones, participants would gain not only access to mobile phones in a communal setting but also practice and improve literacy skills through social interaction.

Private and public partnerships for affordable and accessible ICTs

Short-term alternatives such as those mentioned above need to be supported by wider, long-term efforts to make access to ICTs affordable for those most in need. The public sector, as well as the private sector, civil society and international organizations, could take a stronger, coordinated stand on how to make the growth of the mobile sector people-centred. The provision of ICT infrastructure, including mobile phone technology, could be expanded via public and private partnerships yet regulated so that market growth reaches all users, with information and education regarded as public goods. 'Policies that create a favourable climate for stability, predictability and fair competition at all levels should be developed and implemented in a manner that not only attracts more private investment for ICT infrastructure development but also enables universal service obligations to be met in areas where traditional market conditions fail to work.'²⁶¹

Governments can step in to 'correct market failures, to maintain fair competition, to attract investment, to maximize economic and social benefits'²⁶² – for example, by creating tax incentives for investments in technology infrastructure, along with regulations that are supportive, transparent and pro-competitive yet aligned to national realities and socio-economic development priorities. A balance between private network providers and the state sector can also lead to accountability for the public good.

260 Balasubramanian, K., et al. 2010, pg. 201.

261 World Summit on the Information Society, *Declaration of Principles. Building the Information Society: a global challenge in the new Millennium*, Document WSIS-03/GENEVA/DOC/4-E (12 December 2003).

262 *ibid*

■ Challenge 2: How to engage with conservative socio-cultural norms and practices that limit women's appropriation of mobile phones for learning?

Underlying socio-cultural values and practices can also prevent women from owning and most importantly using mobile phones. This was the case in projects in societies where men dominate decision-making and control of household finances.

Adapting mobile phones to existing socio-cultural norms

The project in Cambodia offered an example of an immediate solution to socio-cultural practices that limited women's ownership of mobile phones: phones were coloured pink to signal that they belonged to women, as a way to circumvent men's prevailing ownership of the device. The goat-rearing project in Theni District, Tamil Nadu, India, also proposed a creative way around the obstacle of phone ownership in the context of male-dominated households. Women in the project carried their mobile phone in a small pouch called a *surukku pai*, which is associated with women's identity and objects in the Indian culture. In contrast with the Cambodia project, the latter solution goes one step beyond by trying to engage with existing socio-cultural factors; it builds on them – the mobile phone is attached to a culturally defined symbol that gives legitimacy or a new meaning to the device, making it less threatening to established norms.

Bringing equitable gender interactions into the mobile learning processes

Projects relied on female teachers as an incentive for female learners to engage with the project and with this obtaining the community's approval and trust for the project activities (e.g. cases in Afghanistan, Niger and Pakistan). At the same time, a female teacher does not guarantee a solution to a sexist teacher-learner interaction; both female and male teachers can reproduce traditional conservative gender values of their societies in learning processes. Teachers as part of mobile learning processes need to be trained and made aware of gender equity in teaching and learning; that is, teaching and learning can be tailored/differentiated around the varied needs and learning outcomes of boys and girls and still remain equal in the learning opportunities and support provided to both.

Turn-taking games

An observation from the project case on mobile game-based learning for ESL literacy notes how in the rural Indian home, technology is used more frequently by boys than girls. In this regard, the following suggestion is made: designers

of mobile learning experiences should experiment with ways to design content so that boys are more likely to share the phones with their sisters. For instance, games can involve turn-taking, be multiplayer, and explicitly use female player characters, roles that boys will not want to play. Further, multiplayer games that require small-group cooperation to achieve game and learning objectives will encourage boys to share the phones with their sisters to achieve these objectives.

Engaging the community and male stakeholders in project implementation

In the Punjabi province in Pakistan, girls' access to school and to learning materials is not only restricted by household poverty factors but also by socio-cultural norms that perpetuate their role in society as traditionally defined by housework and procreation. It can be the case that women's mobility is restricted by their husbands' permission for when and for what purpose they can leave the house. As a way to obtain support for its implementation, the mobile literacy project in Pakistan addressed this obstacle by incorporating the community in designing and implementing the project. The project reported that there was a zero dropout rate for girls attending literacy centres and who used mobile phone mediated instruction. This result was attributed to a community sensitization component of the programme that also helped obtain support from community members. This support was encouraged by social mobilizers identified among the community as well as by key 'village members'; similarly, teachers participating in the programme were selected with the community's approval. Families were then more reassured in allowing girls and women to participate in the programme and furthermore in going to school.

In the Morocco project, socio-cultural constraints restricted male and female communication, including any via mobile phones. The water project manager stated that 'he preferred to talk to men rather than women. This preference was not limited to communication about water issues. He stated that, in general, he was not comfortable having any communication with women in villages via mobile phones due to the adverse effect it would have on his reputation'.²⁶³ As the water reporting system required interaction between this male project manager and the women involved in reporting water problems via the fog phone system, a subtle change in social-cultural limitations had to be integrated into the project. This came in consultation with this stakeholder who was caught between understanding the importance of women's involvement and communication to keep the water system operational and the pervading social-cultural constraints on gender relations. He proposed that women communicate the water issues directly to the NGO instead of to him. He also suggested that any fog phone for the water system should be gender neutral. For example, if the NGO passed out a poster or calling card to women with a phone number on it to report water

263 Dodson, L., 2014.

problems, the documents should only reference the NGO and not contain names so that gender will not become an obstacle in any communication.

■ **Challenge 3: How to make mobile learning and literacy relevant and applicable to the needs of learners and communities**

A relapse into illiteracy – after either a mobile phone technology project or any other educational intervention can be due to: the absence of a meaningful context to use acquired basic literacy skills; decreased motivation due to lack of relevance; geographical limitation to access literacy programmes or other educational opportunities for continuation of learning. ‘A high-percentage of neo-literate women relapse into illiteracy after learning basic literacy skills owing to the difficulty of finding meaningful contexts to use acquired skills, and the absence of relevant resources and support systems to continuously motivate them to use literacy skills’.²⁶⁴

Make content relevant to learners’ daily lives and needs

It is important that project designs are tailored to the interests and educational and livelihood needs of women and girls. In the Afghanistan and Pakistan projects, different types of SMS messages were sent to women on a regular basis taking into account their women’s daily lives: messages covered diverse topics including maternal health, economic empowerment, sanitation and water. Yet, aside from SMS allowing for rehearsing acquired literacy skills, how and for what purpose women used SMS delivered or exchanged information is still not ascertained.

As a step towards critical literacy for women and girls, content delivered and interacted upon via mobile phones should provide reliable information via inquiry/problem-solving learning processes that enables them to question the status quo (e.g. of their socio-economic situation) make decisions and propose alternatives. In the project in Theni District, Tamil Nadu, India, women received information on goat-rearing, governance and fundamental legal rights that was used in their immediate livelihood context. In Cambodia, as part of an existing women’s economic empowerment programme, women received SMS messages with information meant to allow them to make accurate decisions about various topics on agriculture, market prices and disaster awareness and prevention, which expanded their knowledge base relating to their agricultural activities. Knowledge from experts and reliable information from the Ministry of Agriculture was instrumental in helping women make informed choices about the various types of rice that could be produced.²⁶⁵

²⁶⁴ UNESCO, 2009.

²⁶⁵ As ascertained by two anecdotal testimonies documented in UNESCO, 2013c background case study.

In the case of the children's mobile phone game-based ESL acquisition project in India, contextually sensitive design for mobile learning was sought by integrating traditional village games, their rules and mechanics into video game design processes.²⁶⁶

It is also important that mobile-enhanced literacy interventions, usually delivered in non-formal education contexts, take into consideration that adults and children do not learn in the same way: thus, instruction and learning should be sensitive to reaching adults after the age of 24 and girls as young adults between 15-24 years of age and children below the age of 15. These three groups of users have distinct interests and needs and when these are not addressed accordingly, the motivation in and applicability of any general mobile phone and literacy intervention risks subsiding.

Provide instruction and mobile phone features in local and minority languages and use visual literacy strategies

The use of local languages in the delivery mode, interaction and content of mobile phone projects and accompanying teaching material has gained momentum as a positive factor for projects' sustainability and relevance. 'Mobile services and benefits are not reaching intended beneficiaries, and are ineffective in the context of multi-lingual societies or predominantly oral-language cultures. Those least capable of accessing mobile services due to language constraints are poor women – who are most in need of the educational, health and communication benefits of mobiles'.²⁶⁷ Providing instruction and learning with language adaptability according to local identities is paramount in blended-learning modalities of mobile phone enhanced literacy. Blended learning needs to integrate language diversity with consistency across the various learning settings in which the learner is moving – e.g. the formal and non-formal class settings yet as well when learning continues at home.

All cases, except the children's ESL mobile game-based learning project in India, used local languages in the delivery of mobile phone content as well as in the interaction; in this way the projects became better connected to the communities, identity and lives of the women involved. However, an obstacle still remains: the languages of mobile phone settings may not match those of instruction. That is, mobile phones may come in the official language of the country or in the predominant language of the manufacturer. Some devices do allow for settings to be changed, but rarely will it be possible to set the device to local languages as they were in Senegal, where not only literacy instruction but also mobile phone features were set taking into account the community's linguistic diversity.

²⁶⁶ UNESCO, 2013i.

²⁶⁷ Dodson, L., 2014.

On the other hand, another alternative to linguistic or literacy barriers related to mobile phone use includes the use of visual literacy skills as exemplified in the projects in Morocco and Senegal. In the latter, a challenge linked to language diversity occurred when mobile phones were only available in French and English. An initial response by the implementing NGO was to rely solely on the mobile phone icon system to teach menu navigation and to develop the mango tree exercise as a pedagogical technique. Participants relied on the visual analogy of a mango tree and identified a contact's name by moving up the trunk of an imaginary mango tree, selecting a branch, moving along the branch, and finally picking a mango. This reflected as well a diagram/poster of a mango tree hanging on a classroom wall linked to the abstract mobile phone's menu and its functions.

In the Morocco project, participants from an oral-based community relied on self-learned strategies that created 'language' visually by linking icons and numbers. Also, images of water-related problems related to the water-system management were also linked to the keypad numbers and menu icons.

Participatory planning with the community

As noted earlier, participatory needs' assessment was a key trend across most of the projects reviewed. Engaging the community at initial stages of the project design allows for project objectives and activities to be tailored around the varied educational, socio-cultural and economic issues of the various stakeholders. This enhances the potential of the project being sustained due to its useful relevance to community needs and expectations. Evident examples of this include the mobile phone projects that partnered closely with local NGOs and that were running non-formal literacy projects and community empowerment programmes (e.g. cases in Afghanistan, India-Theni District, Niger, Pakistan, Senegal, etc.)

On the other hand, as most effective mobile phone learning for literacy purposes appears to be occurring in blended learning settings, it is important for the public education sector to participate as well in articulation of mobile learning within formal, non-formal and informal education measures along prevailing international and local NGOs as well as by private mobile sector partners.

■ Challenge 4: How to take literacy skills to a higher level of application, retention and social change?

Linking learning to communities and livelihoods (especially in rural areas)

Beyond individual/personalized content, information and knowledge exchanged via mobile phones must be relevant and have application vis-à-vis the communities and livelihoods of women participating in the project. As most projects took place

in rural areas, it is important to consider what kind of rural labour opportunities are available for rural women in connection to their increased education. Education increases women's access to labour opportunities and enhances women's resources and information to claim their rights.

For example, the Theni project in India aimed to promote social entrepreneurship, and enhance livelihood opportunities and empowerment of rural women through the use of mobile phones. This project has been documented to have successfully used mobile phones to helping rural women to be self-directed learners within interactive processes and to participate in economic activities that enhance their livelihood opportunities and skills.²⁶⁸ This project is an example that highlights the role of mobile phones in addressing both learning and economic needs, similar to the Somalia project that aimed to develop literacy and financial skills with the end goal of unemployed youth, including women, being able to secure employment. Along those lines, the projects in Cambodia and Morocco, with different outcomes, also focused on women's mobile learning process being linked to community decision-making processes in the first, and to natural resource management in the second.

In Africa, for example, forms of employment in rural areas are increasingly taking the shape of off-farm employment and micro-enterprises ²⁶⁹ (e.g. new agro-industries, craft production, tourism, etc.). In this regard, mobile phone facilitated literacy skills linked to non-formal TVET could contribute to a renewal of skill development in rural areas.

Linking to inter-sectoral community empowerment programmes

Several of the projects integrated the mobile phone enhanced literacy component into community empowerment programmes. These programmes usually bring together at an NGO level various development sectors (health, agriculture, education). Mobile enhanced literacy projects can help learners apply and retain acquired skills within human development domains that contribute to enlarge individual capabilities.

Making learning continuous and motivated by collective agency

The mobile phone gains social value when 'given shape and meaning by being grafted onto existing rules and expectations about the structure of social relations'.²⁷⁰ In the project in Theni District, Tamil Nadu, India, the mobile phone was instrumental in building cognitive social capital. 'The absence of such collective agencies could be one reason for the digital and gender divides in the use of educational technology in formal education. Cognitive social capital emerges

268 Balasubramanian, K. et al., 2010.

269 FAO, IFAD, ILO. 2010, pg. 44.

270 Omari and Ribak, 2008, pg. 163 quoted in Balasubramanian, K. et al., 2010.

from trust and norms generated from cognitive and interactive processes. It is further reinforced by reciprocity, collective identity, shared beliefs, and recognitions that contribute mutually beneficial collective action. Continuous interactions, dialogues, and debates characterize this process. Thus it acts as a collective agency in addressing common issues²⁷¹. Similarly the fog phone project in Morocco was able to slightly change entrenched gender relations that limited primordial communication that prevented the fog-water distribution system from operating effectively. Women's participation in this process was included within a community that changed its social interaction pattern around gender in order to achieve a collective good: drinkable water.

■ **Challenge 5: How to open mobile learning to a wide range of educational settings and pedagogical processes to reach those in need?**

Mobile phone literacy projects have the benefit of not being confined to specific formal, non-formal or informal learning settings. Delivery can be synchronous (real-time) or asynchronous (delayed) and provide a range of interactions, including teacher-learner and learner-learner dynamics. In the projects reviewed in this report, asynchronous delivery modes were mostly contained within non-formal education settings as way to best reach rural neglected populations with low literacy levels. Most of these modes were supported by self-directed and collective learning strategies.

Blended learning: Mobile learning grafted on to existing non-formal education and community initiatives

Successful projects pedagogically provide flexibility by using mobile phones as a distance-learning tool that mediates learning linked to ongoing non-formal/formal education settings or within the same as part of face-to-face efforts (so-called blended learning). The balance of face-to-face and mobile mediated interaction should be determined by context needs and constraints including the challenge of women far from educational centres who are prevented by household chores and income-related activities from being involved in formal learning settings.

The Afghanistan and Niger projects are examples. In the Afghanistan project, which aimed to develop and retain literacy skills among adolescent girls and women, mobile mediated instruction with SMS was combined with classroom teaching. Learners who benefited from the blended learning approach were able to complete the required literacy levels faster than others who did not benefit from this kind of learning.

271 Balasubramanian, K. et al., 2010.

On the other hand, mobile phone projects are embedded within well-established literacy programmes, the project will be able to benefit from pre-existing professional expertise and institutional stability. The Afghan 'learning centers were supported by an existing and highly experienced staff who was trusted by the students and the community. The literacy teachers involved in the project already had experience teaching literacy courses to students at these centres, which also had an effective literacy curriculum in place. These trained teachers and administrators were able to commit the required resources and energy to the pilot in its two areas of operation in rural Afghanistan'.²⁷² The cases of Cambodia, Morocco and Pakistan are also good examples of how a project initiative can be sustained thanks to partnerships with non-formal basic education entities or local NGOs.

Self-learning and peer-to-peer learning as interactive cooperative learning

Peer-to-peer learning allows for projects to be strengthened through ongoing social interaction that facilitates further connections with the community and provides legitimacy and confidence to project initiatives. Such was the case of the projects in Morocco and in Theni District, Tamil Nadu, India, in which family members and friends helped women to navigate the literacy obstacles of using a mobile phone. In the case of mobile game-based learning games for ESL literacy in India, the informal education pilot showed how rural children could teach one another how to use the device and advance through the games. In the Morocco project, mobile learning also benefited from the women's self-learned strategies to circumvent illiteracy with visual literacy strategies.

Overall, self-directed and collective learning – which are part of local culture and tradition in rural communities – can also serve to creatively overcome literacy barriers that limit women's use of mobile phones. In particular, collective learning (akin to cooperative learning strategies) among peers, households and communities is a key part of lifelong learning. Self-directed and collective learning in combination with visual and oral literacies provide ways of further enhancing mobile phones as learning tools.

■ Challenge 6: Who facilitates or guides the learning process, and how well prepared are they?

Mobile learning – with the advantage of being “mobile” and portable – tends to be disassociated from the role of teachers as mediators or facilitators of the learning, so the preparation and quality of teachers and adult educators in this kind of learning can be neglected.

272 UNESCO, 2013a.

The role of teachers varies across the projects reviewed here, from teachers being involved in managerial and technical supportive roles, to transferring information, to a more pedagogical involvement. The project in Pakistan exemplifies the role of teachers as facilitators in the learning and project implementation process. Teachers were identified in and with the community's consent; this strengthened a teacher-learner trust in the learning experience of the young women and gave legitimacy to the project within the community itself. Teachers were trained to use mobile phones and in combination with other ICTs (i.e. computer and internet). The design of this project also enabled teachers to be supported by other staff, such as 'social mobilizers' as project focal points introducing the benefits of the project to the community; village members who in turn supported the social mobilizer, and a project coordinator who monitored the overall process.

Availability of qualified teachers who are also trusted by the community is rare in isolated geographical rural locations. Due to the low literacy rates in rural areas, in the case of the project in Niger there was not always an ample supply of quality teachers. In particular female teachers are sought after, as most villages did not allow male teachers to teach female students. The challenge in this project was that often there were no literate females in the villages to begin with, or the only (semi-)literate women were young and not self-confident enough to teach older women. Teachers from outside the village were better educated but turned out to be more often absent. It is thus important to raise the literacy of female potential teachers coming from the same communities where the project will take place.

In relation to mobile learning, teachers are needed to mediate the learning process, especially with children who have weak educational foundations.²⁷³ It is important that student teachers learn during their training to critically use mobile phones as part of active guided pedagogies that go beyond the transmission and exchange of SMS messages. This does not imply using complex software applications, but rather knowing how to discern and tailor quality content and interaction derived from mobile learning to ongoing non-formal or formal educational efforts.

■ Challenge 7: How to monitor and evaluate the impact of mobile phone technology on literacy and women's and girls' empowerment

The impact of mobile phone technology in enhancing the acquisition of literacy skills and their application in women's immediate and wider socio-economic and cultural contexts was captured only partially in most of the projects examined.

The UN Literacy Decade proposed that literacy's progress, and thus the progress of mobile enhanced literacy, be followed with firm targets and timetables following three indicators: change in absolute numbers and in the percentages of the literate

²⁷³ Valk, J.H., et al., 2010.

population; relative contribution of formal and non-formal education to attaining literacy; impact of literacy on the quality of people's lives.²⁷⁴

In hand with the first indicator, most of the projects reviewed relied on quantitative literacy testing derived from scientific experimental design methods of measurement. In this regard, quality is defined in terms of speed and efficiency in learning basic skills. Projects' measurements showed statistically significant gains in some of the projects reviewed; this was along literacy approaches akin to a 1958 definition of literacy as the ability to both read and write. In this approach, mastery of basic literacy skills by the learner is deemed as a neutral standard generalized in potential application to various contexts. However, measuring the functional application of these skills in varying contexts was not a trend across the projects reviewed and remained tentative.

Though helpful in measuring a certain degree of impact at an individual level, quantitative methods are limited in reaching deeper into the socio-cultural interactions surrounding women's acquisition and application of literacy skills in their immediate community contexts and into further ones of voice and participation and labour opportunities in line with the third indicator mentioned above. Ethnographic approaches used in some of the projects reviewed are useful in this regard, while qualitative research can also better assess changes in attitudes and behaviours in learners as derived from newly acquired skills and innovative learning experiences.

As noted by one project evaluation, becoming literate 'goes beyond acquiring skills and strategies for working with print. It also refers to the ability to interpret social systems relevant to a particular community'.²⁷⁵

Using wider and deeper qualitative methodological approaches, two projects were able to reveal the empowering intricacies of literacy practices and gender surrounding women's use of mobile phones within livelihood contexts (e.g. Theni District, Tamil Nadu, India, and the Morocco project). Impact extended to a wider social level for stronger collective agency. The projects reported as well that social networking and bonding among participants was strengthened.

Other projects presented anecdotal assertions about the impact of mobile phone enhanced literacy on women's and girls' attitudes and self-confidence (e.g. Afghanistan, Cambodia, Pakistan). Also, mobile phones were documented as triggering additional/spillover benefits for families and communities, which became more supportive of daughters attending school, and some illiterate mothers attending learning centres with their daughters.

274 United Nations General Assembly 56th Session. A/RES/56/116 – United Nations Literacy Decade: education for all. December 19, 2001.

275 UNESCO, 2013h.

Monitoring also needs to be able to follow mobile learning in local languages. A case in point is the project in Senegal that used a variety of local languages in its intervention. The mobile device integrated diversity of language in the phone features. Surveys and interviews about the service showed that participants generally appreciated the flexibility of this feature. They also commended the NGO for allowing them to use the system in the local language of their choice. 'However, this caused significant administrative difficulties to monitor and categorize hundreds of messages sent to the system in Soninke and Diolaa, two languages that were not spoken by any staff member in their Dakar office'.²⁷⁶

Also, who designs the content being delivered and being interacted upon via mobile learning is occasionally not monitored or evaluated. As with curricular issues, a careful assessment needs to be made regarding content and pedagogy with attention on the comparative advantage of using mobile phones versus other numerous tools and how this applies differently by gender.

276 *ibid*

CONCLUSION

Nine projects reviewed, targeting different populations, presenting a variety of literacy conceptions and mobile learning processes, and followed by different methods of implementation and evaluation, may still stand as isolated cases on which it is difficult to comparatively establish an evidence-based claim of what is effective in terms of mobile phone enhanced literacy for women and girls with a subsequent impact on their empowerment.

Much more needs to be known about the potential impact of mobile phone technology in empowering women by improving their literacy.

Considering that most projects took place in rural areas, non-formal education is a common response to scarce formal schooling. In this context, would mobile phone learning (as part of non-formal and/or as informal learning) have a comparative advantage or an additive benefit to promote literacy and in particular that of women? To what extent is traditional formal and non-formal acquired literacy more or less empowering vis-à-vis that enhanced solely by mobile phones understood within the range of informal learning?

In such contexts, do men and women learn differently and also when using mobile phones? Furthermore, cutting across gender, how does mobile phone technology enhance literacy in ways that are adapted to the learning needs of those whose education is at a disadvantage due to their race, ethnicity, sexuality, disabilities and socio-economic status?

Some could argue that if mobile learning is equally 'good' (effective, powerful) for men and women then the issue could be mostly related to an inequality of mobile phone access (the gender divide). Yet, from another perspective, the inequality may also be found in the unequal opportunities that subsequently open for men and women on how to apply any acquired mobile enhanced literacy skill and further knowledge into empowerment domains related to voice and participation and employment.

These questions call for further, thorough and independent research and evaluation methods. Experimental designs with control groups and/or independent/dependent variables can help establish variations to a certain point between mobile phone technology and traditional literacy mechanisms in enhancing literacy. On the other hand, qualitative methods stemming from an interpretivist science tradition do more deeply reveal how and why and in which diverse socio-

cultural and economic circumstances mobile learning experiences unfold with the final goal of empowering women.

Based on the design and evaluation methods used in the projects reviewed, in addition to this report's analysis the following conclusions can be made:

- Mobile phone learning has the most potential to be successful in helping women acquire and practise basic literacy skills when such intervention is embedded within established non-formal literacy and community empowerment programmes. This in order to build learning on aligned educational content and objectives, make efficient use of shared resources and partnerships, and benefit from community support and engagement in project design and implementation. When mobile learning is a component of wider programmes, however, one must be cautious in attributing change solely to this, which could be an outcome of pre-existing or parallel literacy efforts.
- Mobile phone technology interventions related to the enhancement of literacy are promising in helping retain acquired basic skills in women by offering the possibility for them to practise those skills in the form of SMS/text messaging with low-cost mobile phones; women do so motivated mostly by communication/information exchange purposes yet as well, when motivated by needs of autonomy and enhanced participation in learning, community and livelihood contexts.
- In some instances participants, and especially women, expressed a sense of 'empowerment' from using their mobile phones: In this regard, women felt a sense of appreciation from community members, family members and partners. As a trickle effect, stronger community networks and an increased awareness among parents on the importance of education for girls was also initially documented.
- It is vital to investigate further how women and girls use acquired literacy skills to seize other educational opportunities, to transform information into knowledge to increase their voice and participation, and to enhance their employment opportunities. In the projects that aimed to enhance autonomous/neutral literacy skills with mobile phones, the extent to and how acquired skills were retained and further applied functionally in individuals' immediate contexts remains to be explored.
- Only two projects confirmed the potential of mobile phone technology to support continuous learning of women with them becoming active participants in their rural livelihood contexts (i.e. goat rearing; water management). In this regard, collective learning facilitated women's learning including mobile phone enhanced literacy practices with family and peers.
- Available information is not sufficient to determine if mobile phones were more effective than other tools (e.g. ICTs and instructional material) in achieving

learning and livelihood objectives, because of the small number of projects examined, their design and their evaluation methodology. In one case, mobile phones were documented as the preferred and most relevant learning tool to use: participants in the India Theni District project preferred mobile phones as learning tools over attending classes or watching multimedia materials as the latter were deemed to restrict their movement for employment, occupation, and household chores.

- Prior existing knowledge and skills and collective learning influence the extent to which learners may benefit the most from mobile phone-enhanced literacy. Existing spelling proficiency in Indian low-income rural children predicted to a great extent spelling success in words presented in mobile phone games. This phenomenon is relevant to the Niger project in which literacy skills acquired with the support of mobile phones decreased at a lower rate only for students who had reached already a higher proficiency in these skills compared to students with lower scores. Yet, for women participating in the lifelong learning for farmers project in the Theni District in India, literacy was not a precondition for them to make the best use of mobile phones as learning and business tools. Instead, mobile phone supported literacy was advanced due to existing and continuous collective and self-learning strategies that linked the mobile phone to an improved livelihood. Existing visual literacy skills played a considerable role in developing literacy skills in women in an oral based community in Morocco. At the same time, pre-existing literacy skills in younger women in this community allowed them, compared to other age groups with lower literacy levels, to benefit the most of mobile phone texting features as part of the water-management system.
- The role of teachers or trainers in most of the mobile phone projects examined still remains unexplored in its potential to go beyond information transmission, supervision or technical support provision. Teachers' active participation in mobile learning endeavours is still limited by their low literacy and digital skills, especially when recruited in rural areas where it is common to find a diminished and weak teaching force. However, teachers must be trained most importantly, not on how to use ICTs per se, but rather on how to discern and tailor the quality content and interaction derived from mobile learning in ways that are relevant to learning objectives.
- When learners and their communities participate in project design, projects can more accurately include and address varied educational, livelihood needs and strengths as well as socio-cultural factors including languages and dialects.
- Partnerships in recent and current mobile phone-enhanced literacy projects show a considerable presence of external funding (through bilateral development cooperation or research funding) and foreign higher education institutions. This international participation is counterbalanced by strong

project partnership at a local level with NGOs. There is a very limited presence of national public entities in project partnerships.

- The individual and /or collective use of mobile phones in literacy practices in the poor rural settings examined is often constrained by three main factors: a) weak technical infrastructure mostly addressed by short-term alternatives that could be replaced by long-term public/private partnerships that guarantee information and education as public goods; b) language diversity that is not being well integrated into mobile phones and learning processes; the public education sector could play a stronger role in defining language measures for mobile learning in alignment with formal and non-formal education contexts; and c) conservative traditional socio-cultural norms that limit women's use of mobile phones. Communities and their social interactions can hinder access and use of mobile phones as learning or empowering tools, yet they also can facilitate such use through peer-to-peer support and collective learning strategies.

Mobile learning has the potential to reach women whose physical movement is regulated by conservative, traditional socio-cultural norms. However, these norms can go deeper in restricting and pervading the kind of learning that women and girls can experience even if they are reached via mobile devices technology. The challenge is not just access, but rather how women and girls make use of the information and knowledge that reaches them, and how they can transform and reconstruct this in ways that empowers them *to do and to be*, to have voice and participation in their households and communities as well as in achieving decent work opportunities.

Annex 1: Projects reviewed

PROJECTS ^{277,278}

AFGHANISTAN

2011-2012

Mobile Literacy Project in Afghanistan

Target: 50 illiterate and neo-illiterate young and adult women in 2 rural agricultural villages in the Herat Province of Afghanistan.

Purpose: 'To promote basic literacy among women in rural Afghanistan by complementing on-going classroom literacy sessions with text messaging instruction and with this offering them an opportunity to improve their lives, those of their families and their larger communities'.

Mobile Learning Process: A mobile phone-based literacy component was integrated into a non-formal fast-track 9 months literacy program based at learning centres. Texted messages and questions were sent to participants with answers being submitted in written form; accompanied by notebook writing for literacy assignments; content was based on the learner's daily life. Women used a standard 2G system mobile phone with enough texting minutes to complete assignments; a phone card; notebooks.

Evaluation: Pre-tests and post-tests asked the same questions to measure women's ability to read these and to follow directions and formulate response sentences.

Outcomes: 'Rapid progress in transitioning from a literacy course level in only four months instead of nine. 83% of the students benefitting from the mobile literacy component were able to complete the post-test using correct sentences structure and vocabulary (..) a small number of students left the course with the ability to read and understand magazines and newspapers'. *[Application and retention of acquired skills remain uncertain and/or are not documented].*

277 See Table 2 for implementation entities of the nine mobile phone learning projects.

278 Content in this Annex table is a summarized version of the projects cross-examined and referenced in Part III.

CAMBODIA

2010-2012

Pink Phone Revolution

Target: 45 adult women who are female commune counsellors and 7 women producers in three provinces: Kampong Thom, Kratie and Stung Treng; a commune council is the lowest level of public administration in Cambodia.

Purpose: 'To improve communication and coordination among female commune counsellors as part of a women economic empowerment programme; to enable women to receive information on agriculture, market prices and disaster-preparedness; to share knowledge and to report emergencies and domestic violence; to promote female counsellors' leadership skills to better serve community members through mobile phones'.

Mobile Learning Process: Women were trained on how to use the mobile phone. An SMS aggregation/disaggregation system gave the women access to information such as weather forecasts, market prices, farming tips and health advisories. Mobile phones were set up in Khmer and English.

Evaluation: Project monitoring including field visits; progress reports and case studies with the latter including video documentation. Collection of quantitative data related to the number of women able to operate SMS functions and disseminate information.

Outcomes: Women used mobile phones in their daily lives to make calls to other council and community members, and to receive current market prices of agricultural goods. Women were reported to have overcome practical communication limitations caused by geographical distance. *[The mobile phone contribution of this project remained at an information/communication exchange level, with application of information to decision-making documented at an anecdotal level. The extent to which literacy levels of the female counsellors were engaged by mobile phone learning is not evident].*

INDIA, 1st project (English as a Second Language ESL)

2004-2012

Mobile Learning Games for English as Second Language Literacy – 3 Learning Settings/ Mobile and Immersive Learning for Literacy in Emerging Economies.

Target: Children in low-income rural and urban slums in 3 states in India: Andhra, Pradesh and Karnataka in the south and Uttar Pradesh in the north.

Purpose: A three-pronged pilot research project used mobile game-based learning for children's English Second Language acquisition; to understand the impact of immersive, mobile game-based learning as a complement to school and other educational resources.

Mobile Learning Process: A mobile-based game application was used to teach children how to recall English words and phrases by focusing on literacy sub-skills including phonological and orthographic awareness; oral vocabulary knowledge, phonetic decoding, and word identification. Games were tailored around the children's traditional village games.

One pilot/formal: Urban slum children attending low-fee private schools; 250 students in grade 5; a mobile phone with an ESL game-based learning application was used during '59 to 90 sessions' that were integrated into existing non-official class periods during an entire academic year.

Second pilot/non-formal: The same ESL mobile game-based application was used, but as part of an after-school programme open only to children in neighbouring villages whose parents could not afford the fees

for this private school. This pilot engaged 27 children (eleven boys and sixteen girls) from grades 2 to 9 during twenty-seven two-hour sessions that took place three times a week.

Third Pilot/informal: 18 rural children in India used at home the game-based application over a 26-week period. Project staff visited the participants twice a week during the first ten weeks to ensure that they were confident about solving simple technical problems on their own.

Evaluation: Project self-evaluation/three rounds of summative evaluations for a period of four semesters with post-test gains on three literacy sub-skills. (Baseline English literacy level was determined informally by observation and by difficulty in spelling name in English). Also quantitative and qualitative data were collected via a mixed methods approach.

Outcomes: Post-test gains on measurements of three literacy sub-skills.

Pilot A/non-formal after-school rural intervention: Statistically significant post-test gains on spelling skills.

Pilot B/formal school urban slums: Significant post-test improvements on measurements of orthographic awareness and oral vocabulary knowledge.

Pilot C/informal learning: Each week the average child learned an average of three new vocabulary words, based on games tracking the extent of their usage of at least 2 hours 23 minutes per week.

INDIA – Tamil Nadu, Theni District

2009-ongoing

ICT-based Lifelong Learning (L3) for Farmers' Activities– Women and Goat Rearing/ Case Study Vidiyal

Target: 320 women farmers (illiterate; semi-literate); 25 rural villages in Tamil Nadu, Theni District (Southern India).

Purpose: To empower women in non-formal and informal learning settings with low-cost technologies (e.g. mobile phones) offering the means to accelerate this process in the context of cognitive social capital; to study the use of mobile phones as learning and business tools for lifelong learning among rural women from resource poor communities with attention to distance learning, gender dimensions and social capital.

Mobile Learning Process: In collaboration with women's self-help groups, women farmers with interest in goat-rearing enterprises used low-cost mobile phones for lifelong learning. Learning involved two axes: a vertical flow of knowledge from knowledge institutions to the community, and a horizontal transfer of knowledge within the community. Face-to-face training was provided on how to use the mobile phone. Daily text messages were sent to participants on topics including buying the goats, feed management, disease and health management, and marketing management. As part of collective learning, women were trained in 'effective mobile phone conversation' to discuss their enterprises among themselves. As part of inquiry-based learning, women discussed and verified information received with family and peers; women were encouraged to reflect and write about this in diaries with notes being further discussed during the women self-help group meetings in ways in which content was turned into action for better goat-rearing.

Evaluation: quantitative structured surveys and qualitative social–anthropological tools and participatory rural appraisal techniques such as focus group discussions, participatory observation, and interviews.

Outcomes: Of the women interviewed, 82 per cent stated that mobile phone-based training is more useful and easier than face-to-face training, which is financially and socially inconvenient. The project documents how the women learn effectively given the appropriate opportunities including procedural knowledge and development of constructed knowledge. Such knowledge has been influenced by the strong cognitive social capital developed through the learning and sharing processes. The project did not deliberately document how literacy levels changed among participants; however, these were implicitly

enhanced and applied when women were enabled to send cost-free text messages and motivated to write in diaries about the messages received; this was done with the help of family and the self-help groups. Women's voice and participation in their communities and households was enhanced as part of collective agency: 'empowerment results from women's participation in learning and in ownership of assets'. Women achieved the granting of credit to start up small enterprises in goat- and sheep-rearing; formal training and the resultant self-directed learning enabled these women to run viable enterprises and repay credit.

MOROCCO

2012 - 2014

Mobile Use and Literacy in Oral-Language Communities: Berber Women's Management of a Fog-Water System in Rural Morocco

Target: Non-literate and semi-literate women (18-80 years of age) of a Berber oral-based community in the Anti-Atlas Mountains of Morocco. Rural southwest Morocco has multi-lingual societies and predominantly oral-language cultures (e.g. with spoken dialects – Berber and spoken Moroccan Arabic).

Purpose: Ethnographic research study aiming to increase women's use of mobile phones including their ability to text in relation to their daily lives and livelihoods, and in particular as a way to make them active participants of a technology-enabled water-management system; to study technical, linguistic and cultural challenges to mobile use by low-literate women; these issues were integrated into the design of a gender-inclusive information system intended to help women in their management of a fog-water distribution system that will deliver water from the Anti-Atlas Mountains to Berber villages.

Mobile Learning Process: Ten training workshops took place with Berber women meeting at an argan oil cooperative to teach them how to use and practice mobile phone text-based features with Roman letters. Self-directed learning and collective learning strategies (informal learning circles) facilitated women's use of the mobile phone text-based features, including the application of women's visual literacy skills to provide meaning to letters and numbers and to memorize keypad sequences and phone numbers. SMS sample message workbooks were also used by the women to consult and practice sending messages. The project relied on a varied second-hand low-end feature phones already owned by the Berber women, and which generally did not support Arabic script. The project designed a gender-inclusive technology based fog-water management system relying on women's timely and accurate SMS communication exchange. A water problem reporting syntax was created based on water problem concepts, visual icons and Arabic and Latin scripts. Messages exchanged included water problems as well as non water-related social/health topics.

Evaluation: Progress and impact was followed with a Sustainable Livelihoods Framework to assess assets and capabilities that individuals and communities have to cope in vulnerability contexts; Stakeholder Analysis and Ethnographic Action Research including semi-structured interviews, participant-observation, key informant interviews and collection of secondary material to gather data on mobile phone use by low-literate Berber women. 58 interviews were undertaken with women aged 18 to 80; two pilot tests of the Fog Phone design and implementation took place; content analysis of 81 SMS messages.

Outcomes: Via interviews women reported that they had little or no literacy prior to the project. Women's main motivation to learn how to use SMS was to maintain and expand social connections and to have privacy and independence. Women who reported that they could independently send or read a text message ranged in age from 18 to the mid-30s; this age group was also identified as sending longer messages in the fog phone water reporting system. Women who attended the project workshops 'made progress towards narrowing their personal mobile utility gap: those who had some SMS skills improved their ability to send texts; a handful of entirely illiterate women developed the ability to write their name in their phone,

on paper, and on a chalkboard'. Barriers hindering women's use of the mobile phone included: low literacy levels; complex language environments do not match standard mobile interfaces; traditional socio-cultural norms. In the context of the fog-phone water reporting system, women were enabled to participate in a water management structure that was traditionally male dominated. The number of messages decreased towards the end of the project due to a lack of phone credits to send an SMS; inability to send SMS after the mobile network failed during a strong windstorm; and a lower frequency of water problems to report on.

NIGER

2009-2011

Alphabetisation de Base par Cellulaire (ABC)

Target: Adults in 117 rural villages in 4 districts in the Dosso and Zinder regions.

Purpose: 'To give adult literacy participants the opportunity to practice via mobile phones basic literacy skills acquired in a non-formal adult literacy and numeracy programme; to increase the application of writing skills in the context of cash crops and to improve participants' agricultural marketing knowledge'.

Mobile Learning Process: A mobile phone texting module of eight months, one day per week, was incorporated into a five-days a week non-formal adult literacy and numeracy programme over a two year period; classes were disaggregated by sex due to socio-cultural norms. Participants learned where numbers and letters were in handset and how to send and receive calls and how to use SMS texting features; low-end, multimedia phones were programmed in local languages; one phone was provided per five people.

Evaluation: A randomized control trial measured change in participants' literacy and numeracy test scores.

Outcomes: On average, test scores in villages that incorporated the mobile literacy component were 13 per cent higher for writing and 8 per cent higher for math than in the villages that received traditional literacy classes with no mobile phone intervention. These differences are reported as statistically significant. As literacy classes using the mobile phone component had been disaggregated by sex, it was possible to note that there were relatively equal effects on men and women, young and old. Women's test scores were relatively lower at the outset and after the programme. Seven months after the programme ended, there was a depreciation of achieved skills across all learners yet with this being smaller in those who participated in the mobile phone component group but only for those who were at the upper end of the distribution with higher test scores in writing or math.

PAKISTAN

2009-2012

Mobile-based Literacy Programme

Target: Illiterate rural adult and young women (15-30 years of age) in 4 districts of Punjab Province.

Purpose: To help retain literacy and numeracy skills of new literate women; 'the primary objective was the empowerment of young rural women, in order for them to enjoy an improved status and livelihood through exposure to increased knowledge and access to technology'.

Mobile Learning Process: Training was provided in a way in which the mobile phone could be used as practice tool to reinforce literacy skills acquired by women when participating in existing literacy centres. Six to eight messages a day were sent to women and adolescent girls at three different intervals during the day; covering diverse topics with specific relevance to their lives, including maternal health, economic

empowerment, sanitation and water. A text messaging software was also used to send these messages to participants expecting them to respond to automatic multiple-choice questions. This mechanism also served to monitor students' participation by recording their responses to sent questions.

Evaluation: Pre and post evaluation compared the literacy skills of learners.

Outcomes: After four months of training participants were documented to show improvement in literacy skills, as well as enthusiasm for using mobile phones to learn literacy skills. 'Learners learned basic numeracy skills to solve basic math problems/money problems and to read written documents in Urdu'; they improved their writing of object names. *[The evaluation did not ascertain for how long the acquired literacy skills were retained].*

SENEGAL

2009 – 2010

The Jokko Initiative

Target: Adult and adolescent participants in 200 villages in the rural Velingara District in the South-East region of Senegal; women being 49% of all adults, girls 59% of the adolescent group.

Purpose: To harness the potential of mobile phones firstly as pedagogical tools to teach and reinforce literacy, organisation and management skills, and secondly, as social mobilisation tools that help to build consensus around local development initiatives.

Mobile Learning Process: A non-formal literacy component of a community empowerment programme is supported by a mobile phone-based literacy intervention in the local language in which learners use SMS/texting to practice acquired literacy skills; classes were held two to three times a week, for an average of just under three hours. Local trainers facilitated approximately 25 sessions on mobile phone literacy and the potential of mobile technology for community development. Classes of 50 participants on average were taught how to use mobile phones including texting features. Visual literacy skills were used by participants to make up for their low literacy levels. Other 'traditional' literacy tools used were a blackboard, chalk and flipcharts. A subsequent phase of mobile phone literacy included implementing an SMS aggregation/disaggregation service in local languages. The service reached communities that benefitted from the mobile phone literacy classes, yet also other populations outside of the project and programme.

Evaluation: An external evaluation involving 15 communities that participated in the project. A baseline survey took place after the first four months of literacy training and at the beginning of the mobile phone training. It covered demographics (age, gender, education, income, and employment); mobile phone usage; literacy and numeracy; and social networks. A literacy test asked people to link two pictures to the appropriate word, to read two sentences, and to read a paragraph and answer questions about it. Partial credit was given for the sentence reading and there were four facts to recall from the paragraph. The numeracy test asked people to read three numbers and to do four simple arithmetic problems.

Outcomes: Only 8.5 per cent of female respondents in the baseline survey reported being able to read text messages received, which increased to 63 per cent at the follow-up. The number of participants able to use a mobile phone rose by 40 per cent; the number of participants able to read received text messages rose by 60 per cent, and the number of messages sent and received rose by 400 per cent. Text messages were mainly sent to community members, friends and family about community events as well as financial and medical problems. Participants, especially women, are reported to have expressed a sense of empowerment, in addition to improved literacy, after having completed the mobile phone literacy training. *[Application of acquired functional literacy skills via SMS remained documented at a communication level].*

In relation to the SMS aggregation/disaggregation service, the evaluation had the limitation that 36 percent of users had not participated in the mobile-phone literacy component and/or the community empowerment programme. Among those who did, use of the system was frequent while the community empowerment programme was in place. Afterwards, community messages dropped significantly; the system also experienced a breakdown after classes finished, which may have lowered participant use. *[Literacy levels between participants and non-participants were not ascertained].*

SOMALIA

2008-2011

The Dab IYO DAHAB Initiative

Target: Youth (247 female; 313 male) in Puntland, South Central Somalia and Somaliland.

Purpose: To build basic money management skills (financial literacy skills) among youth and women so that they can make informed decisions about their personal, households and/or small businesses; to implement basic mobile phone technology as a tool to empower Somali youth, particularly young Somali women, and more generally, to enhance existing grassroots education, financial literacy, and poverty-reduction initiatives.

Mobile Learning Process: The mobile phone-based component with emphasis on the acquisition of financial literacy skills was integrated into a community empowerment programme targeting Somali youth and their livelihoods/employment skills. The mobile phone component combined the region's oral literacy tradition of educational storytelling with new terms related to financial management in a series of 40 audio clips. Through touch-tone keypad menus, low-literacy youth tested their knowledge of financial concepts using mobile texting and audio services (interactive audio instruction, or IAI, that involved access to an interactive audio library). Participants were taught how to use mobiles for learning, for creating social and professional connections, for expanding general knowledge and for accessing information. Additional customized mobile software components were integrated, including touch-tone audio quizzes and SMS-based listenership tracking tools, accessed via a toll-free hotline. These were used to track and test listeners' knowledge with quizzes that prompted youth to answer questions about the day's lesson via their phone's keypad. Interactive financial literacy mobile services were rolled out later on in the project, testing knowledge of key concepts and getting real-time feedback.

Evaluation: An outcome evaluation toward the end of the project's lifespan was carried out by the project's implementer to identify any potential positive change in attitudes or knowledge among participating youth; 762 youth took part in the pre-test, and 340 took part in the post-test.

Outcomes: A statistically significant improvement in test scores was reported, for both the attitudinal and knowledge-based questions. The concepts in which youth demonstrated the most knowledge improvement were 'saving money' and 'establishing and reaching financial goals'. Youth also demonstrated some (albeit lesser) improvement in their understanding of budgeting to manage one's finances. Most youth were able to: correctly identify liability vs. asset; calculate personal net worth; define 'debt' and 'asset'; and identify a long-term financial goal. *[Although attitude and knowledge-based questions were used as part of test scores, these may still not show the application of financial concepts to real-life situations; application of acquired skills or concepts via SMS and/or audio mobile phone mechanisms remains documented at an initial retention level. With regard to the project's impact on women, no instrument of measurement was used, but project staff at an anecdotal level reiterated that the use of mobile technology was significantly beneficial for girls and youth women].*

Annex 2: Literacy definitions and distinctions

1. Literacy as a set of autonomous/neutral²⁷⁹ skills²⁸⁰

Autonomous or neutral skills are deemed to be independent of social and individual backgrounds and contexts and are expected to be acquired by individuals along standard cognitive processes of learning. These are the so-called basic literacy skills – reading and writing, and numeracy– as well as digital skills. (Oral and visual literacy will be referred to separately; oral literacy, for example, implies a ‘dialogue’ and social interaction with context in order to be.)

Reading and writing skills

Reading and writing are associated with individuals’ cognitive skills. Some cognitive learning theories emphasize how individuals use phonetic approaches (or phonological awareness) to learn to read and write. Other approaches focus on acquiring these skills via meaning derived from context. Reading for example, can be acquired through initial recognition of phonemes and their sounds and with the support of larger language units in a holistic context of meaning. Several have argued how vocabulary acquisition and instruction and the ability to infer the meanings of new words from context are strongly related to reading ability.²⁸¹

In regards to first and second language acquisition, studies have shown that native language higher-order thinking, including cognitive skills and knowledge structures are maintained by the learner when transitioning to a second language.²⁸² ‘Key to the interpretation of literacy as reading and writing skills is the issue of the language in which one learns to read and write. The right to learn a language is quite different from the right to learn *in* that language’.²⁸³

The approach to literacy as an autonomous/neutral set of skills is akin to how literacy is currently measured at a global level with methods including population censuses and household surveys²⁸⁴ as well as tests of achievement at varying levels. The first two have the caveat that respondents tend to overstate their literacy level and the latter implies that individual skills be measured in a large or broad enough population sample. In these measurements, following the UNESCO

279 In Paulo Freire’s terms: a separation between text and context; reading the word vs. reading the world.

280 Drawing partially from the conceptual organization – first two understandings of literacy - presented in Chapter 6, Understandings of Literacy in the UNESCO. 2005a. *EFA Global Monitoring Report 2006: Literacy for Life*. Paris, UNESCO.

281 For example see Beck, L.L., McKeown, M.G., Sinatra, G.M., and Loxterman, J.A. 1991.

282 See Cummins, J. 1979 and Cummins, J. 1987.

283 UNESCO, 2005a, pg. 136.

284 The UNESCO Institute of Statistics collects literacy data worldwide in this way along a literacy definition of 1958; we refer to these measurements in order to address the status of literacy at a global level.

resolution of 1958, literacy is defined as the ability to both read and write, with understanding a simple statement related to one's everyday life.

In this regard, in addition to using the 1958 definition of literacy, the UNESCO Institute of Statistics (UIS) is aiming to measure a full range of reading and numeracy skills applicable to educational and daily-life demands in several languages through the Literacy Assessment and Monitoring Programme (LAMP). The diversity of language in literacy assessments is essential when considering how to adapt the content delivered and exchanged via mobile phone technology to learners' needs, culture and identity.

At the time of UNESCO's 1958 definition, post-Second World War universal and national literacy efforts aimed to eradicate illiteracy in hand with the promotion of basic education. However, successful literacy campaigns, such as Cuba's in 1961 and Nicaragua's in 1980, remain rare.²⁸⁵ The International Conference on Adult Education, held in Montreal in 1960, stated aims that were echoed forty years later in the Education for All (EFA) goals and Millennium Development Goals (MDGs) of 2000: 'to eradicate illiteracy in just a few years that would bolster isolated national efforts in developing countries, with the financial support of industrialized countries'.²⁸⁶

Numeracy skills or mathematical literacy

Numeracy is usually regarded as a set of skills complementary to literacy, or as a component of literacy itself.²⁸⁷ Going beyond numeracy skills as the foundation of mathematics, numeracy can also be linked to mathematical literacy, for example as defined in 2012 by the Programme for International Student Assessment (PISA): 'an 'individual's capacity to formulate, employ, and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts, and tools to describe, explain, and predict phenomena. It assists individuals to recognize the role that mathematics plays in the world and to make the well-founded judgments and decisions needed by constructive, engaged and reflective citizens'. In this regard, numeracy is part of numerical reasoning and processes that involve interpretation and communication appropriate for a variety of contexts. This approach increasingly refers to numeracy as a competence that can lead to more effective participation in relevant social activities.²⁸⁸

Digital skills

Associated with the so-called 21st century skills, digital skills are assumed to enhance individuals' participation in all aspects of the information and knowledge

285 Arnone, R. and Graff, H. (eds), 1987.

286 UNESCO, 2005a, pg. 153.

287 Coben, D., with contributions by Colwell, D., Macrae, S., Boaler, J., Brown, M. and Rhodes, V. 2003. *Adult Numeracy: Review of Research and Related Literature*. London, National Research and Development Centre.

288 Ibid & Evans, J. 2000.

society. From a functionalist perspective, they are considered necessary to obtain employment²⁸⁹ in a digital economy in which ICTs 'become key drivers of innovation, growth and labour productivity'.²⁹⁰ A more critical approach considers these skills in relation to socio-economic, cultural and political factors, and power relations underlying the 'digital divide', or digital inequalities.

Literacy as applied skills²⁹¹

The practical application of basic literacy skills was conceptualized in the 1960s and 1970s as 'functional literacy'. This concept initially emphasized the impact of literacy on labour and economic growth. Views of functional literacy often assumed literacy could be taught as a universal set of standard skills (applicable everywhere and to be learned in the same way). Literacy was seen as neutral and independent of social context. Along these lines, the UNESCO Experimental World Literacy Programme (EWLP) in 1966, supported especially by UNDP, promoted the notion of literacy being acquired via experimentation and work-oriented learning.

Influenced by human capital models supporting literacy as a necessary condition for economic growth, UNESCO's General Conference in 1978 recommended a definition of functional literacy that included community development: 'a person is functionally literate who can engage in all those activities in which literacy is required for effective function of his or her group and community and also for enabling him or her to continue to use reading, writing and calculation for his or her own and the community's development'.

Literacy as a lifelong learning process for individual and social change

Building on understandings of functional literacy as implying the application of skills not only in economic but also in socio-cultural contexts, later definitions proposed literacy as a lifelong learning process combined with a critical theory perspective. Literacy can encompass autonomous/neutral skills, functionally applied in context, yet can also be taken forward from a local/individual learning experience to include participation in wider economic, social, cultural and political spheres.²⁹² Literacy is inherent to a continuum of learning in connection to society and a human right essential for lifelong learning and social change.

In this wider approach, literacy goes beyond the application of an 'autonomous' technical skill to gain meaning as an individual action of social practice embedded in social settings 'contextualizing the event in the power structures and cultural

289 French, R., 2014.

290 OECD, 2014.

291 Drawing partially from the conceptual organization – first two understandings of literacy – presented in Chapter 6, Understandings of Literacy in the UNESCO *EFA Global Monitoring Report 2006: Literacy for Life*.

292 See Torres, C.A. and Arnove, R.F. 2007.

meanings at play'.²⁹³ This understanding has been reinforced by arguments for the value of literacy as practised in social and cultural contexts. For example, literacy learning also involves a dynamic of new identities being formed alongside new social practices, including those of participation as part of a community. In this regard, the New Literacy Studies (NLS) emerged as an interdisciplinary field studying language, learning and literacy in an integrated way in the full range of their cognitive, social and cultural contexts.²⁹⁴

Literacy is inherent to a continuum of learning in connection to society. Individuals learn if such learning is connected with relevance to the world around them. As Freire and Macedo wrote in 1987, 'Reading does not consist merely of decoding the written word or language; rather, it is preceded by and intertwined with knowledge of the world'.²⁹⁵

Literacy as a human right, essential for lifelong learning and social change, gained support with the 1996 Report of the International Commission on Education for the Twenty-First Century, and the 1997 Hamburg Declaration: 'Literacy, broadly conceived as the basic knowledge and skills needed by all in a rapidly changing world, is a fundamental human right. (...) There are millions, the majority of whom are women, who lack opportunities to learn or who have insufficient skills to be able to assert this right. The challenge is to enable them to do so. This will often imply the creation of preconditions for learning through awareness-raising and empowerment. Literacy is also a catalyst for participation in social, cultural, political and economic activities, and for learning throughout life'.²⁹⁶

This more recent concept of literacy is captured in a 2013 report, paraphrasing Ralf St. Clair: 'The question, then, is not so much what literacy can do for people; but rather what people can do with literacy. How it is acquired and how it is used determines its value for the learner'.²⁹⁷

In this regard, in 2003 UNESCO proposed a definition of literacy as 'the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve his or her goals develop his or her goals, develop his or her knowledge and potential, and participate fully in community and wider society'.²⁹⁸

Such an approach was reinforced by the Belém Framework for Action in 2009: 'literacy is an indispensable foundation that enables young people and adults to engage in learning opportunities at all stages of the learning continuum. The right to literacy is an inherent part of the right to education. It is a prerequisite for the

293 Quoted as Street, B., 1993, pg. 7 in Barlett, L., 2003.

294 See Gee, J.P., 1990, Barton, D., 1994, Barton and Hamilton, 1998, Street, B. 1988.

295 Freire, P. and Macedo, D. 1987, pg. 29.

296 UNESCO, 1997.

297 UNESCO-UJL 2013 with reference to St. Clair, R. 2010.

298 UNESCO, 2005b, pg.21.

development of personal, social, economic and political empowerment. Literacy is an essential means of building people's capabilities to cope with the evolving challenges and complexities of life, culture, economy and society'.²⁹⁹

Critical literacy

Tightly linked with critical pedagogy³⁰⁰, critical literacy is understood as the extent to which literacy empowers learners to bring about change within the 'problematics of power, agency and history'.^{301 302} As Paulo Freire, who envisioned a 'world that is more round, less ugly, and more just' remarked in relation to the proposal of a literacy programme: 'We wanted a literacy programme which would be an introduction to the democratization of culture, a programme with men and women as its subjects rather than as patient recipients, a programme which itself would be an act of creation, capable of releasing other creative acts, one in which students would develop the impatience and vivacity which characterize search and invention.'³⁰³

Oral and visual literacies

Oral literacy

'There should be no doubt that every population of this world has the same capacity for logical reasoning. The old argument that illiterate groups have a less logical way of reasoning has been invalidated'.³⁰⁴

Anthropological and developmental studies have enriched the understanding of literacy as connected to oral culture. These studies have unveiled the extent to which oral language transports logical information through means of dialogue, and how literacy as written language is built upon a strong oral tradition and thrives only if a living oral culture sustains it.³⁰⁵ Oral face-to-face communication has a variety of ways to express meaning. The outcomes of both literacy and orality depend on social context.

On the other hand, scientific approaches behind phonological analysis have given rise to claims that writing is the transcription of speech and hence 'superior' to it. Similarly, some claim the alphabetic system is technologically superior to

299 UNESCO- UIL. 2010, pg. 6.

300 Freire, P., 1996.

301 Macedo, D. (with reference to Henry Giroux) in Introduction – Freire, P. 1996. pg. 17.

302 See Giroux, H. A., 1988.

303 Freire, P. 'Education for Critical Consciousness/Education and Concientizacao' in Araujo Freire, A.M. and Macedo, D. 2000 (eds.) *The Paulo Freire Reader*. New York, The Continuum International Publishing Group, pg. 82.

304 Elwert, G. 'Societal Literature: Writing Culture and Development' quoting Elwert and Sehoueto, 1999; Scribner and Cole, 1981; and Triebel, 1997 in Olson, D. and Torrance, N. 2001. *The Making of Literate Societies*. Malden, Mass, Blackwell, pg. 61.

305 Olson, D. and Torrance, N. 2001, pg.6

other script forms, since it is phonetic, rather than reliant on pictures to denote meaning.³⁰⁶

Some claim that the human brain reserves a special part for decoding letters into sounds and vice versa (only necessary if one is using an alphabet). Yet, every other feature of reading in the brain uses the same parts of the brain used to understand oral language and the world as social context. Comprehension of oral language, written language, and the world uses the same mental capacities. Thus, especially for new readers, oral language comprehension sets the limit of written language comprehension and comprehension of the world facilitates and is facilitated by reading. Literacy efforts involve all the three aspects.³⁰⁷

In terms of numeracy, most adult learners already know oral counting and some mathematical structures, and have an art of mental arithmetic more or less adequate for their daily life; in fact, many 'illiterate' adults (especially those involved in trade) are better at mental arithmetic than are more 'educated' people.³⁰⁸

Maintaining and developing oral skills can be a means of language preservation, since many languages do not have (or are less compatible with) equivalent textual scripts and thus run the risk of extinction as younger generations adapt to written languages employed in schools.

Visual literacy

From a semiotic point of view, 'reading may mean not only the decoding and understanding of words, but also the interpreting of signs, symbols, pictures and sounds, which vary by social context.³⁰⁹ Since the Enlightenment, scripts as technologies were thought to have evolved from simple picture writing, through word scripts, to syllabaries, culminating with the alphabet.³¹⁰ According to this view, 'non-alphabetic writing systems are primitive and unsuitable for intellectual functions'. Such view left aside the fact that different scripts – whether they use signs or symbols – represent events and languages in different ways, thereby accomplishing different functions'.³¹¹

From another angle, research into visual literacy has challenged the assumption that people can understand posters and leaflets, for example, more easily than words. People who lack exposure to two-dimensional images and are unfamiliar with their conventions can find photographs to be cluttered and their perspective

306 UNESCO, 2005a., pg.149.

307 See Adams, M. J. 1994. *Beginning to read: learning to about print*. Cambridge, MA, MIT Press; Gee, J.P. 2004. *Situated language and Learning: A Critique of traditional Schooling*. London, Routledge. Greensbacker, M.A., Varner, K.R., and Faust, M. 1990 'Investigating differences in general comprehension skill'. *Journal of Experimental Psychology: Learning, Memory and Cognition* 16, pp. 430-45.

308 *ibid*.

309 See Cope, B. and Kalantzis, M., 2000.

310 Gelb, 1963 quoted in Olson, D. and Torrance, N. 2001. *The Making of Literate Societies*. Malden, Massachusetts, Blackwell.

311 Olson, D. and Torrance, N. 2001.

confusing, or line drawings and cartoons to be full of 'strange' conventions such as bubbles and arrows. It has been observed that people 'learn to read pictures just as they learn to read the pages in a book. This is not recognized because education in reading pictures is an informal process. It goes on automatically in societies where a variety of pictures are presented daily through a variety of media. In social environments with no pictorial tradition or very few pictorial representations ... the informal process of learning to read pictures simply does not occur',³¹²

312 UNESCO, 2005a.

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Mobile Phones & Literacy

Empowerment in Women's Hands

Despite the advancements made by Information and Communication Technologies in several international development sectors, further evidence is needed on how mobile phone technology is reaching women, improving their learning, and providing them with new opportunities and better living conditions. Can mobile phones develop women's literacy and strengthen their capability to choose and benefit from wider educational, social and decent work opportunities that can improve their lives? Based on a cross-analysis of nine mobile learning projects in three world regions, this publication sheds light on the extent to which mobile phones can enhance women's literacy and lead to their empowerment. The challenges encountered among the nine projects reviewed and the recommendations derived from these experiences provide a way forward for policy-makers and practitioners in the conceptualization and implementation of quality mobile learning as part of women's human development.



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