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Mobiles For Reading: A Landscape Research Review

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MOBILES FOR READING: A LANDSCAPE RESEARCH REVIEW

June 2014

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The views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

FOREWORD

The *Mobiles for Reading: A Landscape Research Review* was commissioned by the United States Agency for International Development (USAID) on behalf of its support for the Mobiles for Education (mEducation) Alliance (www.meducationalliance.org) and the All Children Reading: A Grand Challenge for Development (ACR GCD) (www.allchildrenreading.org).

This review reflects the significant and important work by a collaborative team of technology, education, and literacy researchers and practitioners and with overall direction for the work provided by USAID.

The University of Pennsylvania team was led by the principal author, Daniel A. Wagner, UNESCO Chair in Learning and Literacy, and Director of the International Literacy Institute at University of Pennsylvania, with the assistance of a student research group that included Nathan Castillo, Molly Crofton, Katie M. Murphy, Harrison Phelan and Fatima Tuz Zahra.

The JBS technical team included Rebekah Levi, Archana Chidanandan, Chrissy Kulenguski and Lauran Potter.

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We hope the general reader, researchers, and practitioners of this review will benefit from its overall organization: providing snapshots and syntheses of 44 global projects that are currently using mobile technologies (broadly defined) to improve reading skills across the continuum of education interventions.

While there is much to be done in the way of rigorous evaluation of these and other promising interventions, the potential for cost-effective, ground-breaking, and scalable application of mobile technologies to advance literacy worldwide is truly impressive.

A huge thanks to Dan Wagner, his team at University of Pennsylvania, JBS staff, and to the others who significantly contributed to this review to move us further towards this horizon.

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LIST OF ACRONYMS AND ABBREVIATIONS

ACR	All Children Reading: A Grand Challenge for Development
ADB	Asian Development Bank
AFD	Agence Française de Développement
Apps	Applications
DFID	UK Department for International Development
EFA	Education For All
EGRA	Early Grade Reading Assessment
GMR	Global Monitoring Report (UNESCO)
HCI	Human-Computer Interaction
ICT	Information and Communications Technology
ICT4D	Information and Communications Technology for Development
IDB	Inter-American Development Bank
IPR	Intellectual Property Rights
IVR	Interactive Voice Response
L1, L2	First Language (mother tongue), Second Language
LMIC	Low and Middle Income Countries
LOI	Language of Instruction
M&E	Monitoring and Evaluation
M4R	Mobiles for Reading
MDG	Millennium Development Goals
MOOC	Massive Open Online Course
NFE	Non-Formal Education
NGO	Non-governmental Organization
OECD	Organization for Economic Co-operation and Development
PSE	Poorly-Supported Environment (for learning)
RCT	Randomized Control Trials
SQC	Small, Quicker, Cheaper (approaches to assessment)
STEM	Science, Technology, Engineering and Mathematics
TCO	Total Cost of Ownership
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USSD	Unstructured Supplementary Service Data
WSE	Well-Supported Environment (for learning)

EXECUTIVE SUMMARY

According to United Nations data, millions of children and youth cannot read a short paragraph in any language. Nearly 70 million children worldwide are not in school; the majority are girls.

Though the statistics are distressing, there is some reason for optimism. Significant gains have been made in recent decades toward reaching international educational goals. Many of the world's poorest countries have dramatically increased the percentage of children now in school. The number of schools has also greatly increased, and the types of educational resources found within schools have expanded beyond traditional chalkboards and textbooks to include new educational technologies and digital resources.

One of the biggest challenges today is that while millions of additional children are now being schooled, there is growing evidence that the quality of their learning experiences is still so poor that they do not learn how to read. Further, recent reading assessment studies indicate that many primary school children, even by grade three, cannot read a single word in any language.

This landscape review takes the broad domain of new information and communications technologies (ICTs) for education, and focuses on the fast-evolving sub-domain of *mobiles for reading*, or M4R. The 'mobiles' in this review primarily refer to mobile technologies—ICTs that are portable, typically battery powered, and may be connected to cellular networks and/or the Internet. The term 'reading' refers to the joint abilities of understanding and producing written language, for children, youth and adults. This review of M4R focuses primarily on the use of mobile ICTs designed to help children *learn to read, practice reading* (reading to learn), and acquire a broader range of learning skills that support a literate society. These issues are discussed in seven sections described below.

1. *Introduction*. This first section includes definitions of what comprises mobiles for reading (M4R), in the broader space of mLearning. It also includes a specification of the populations in low- and middle-income countries (LMICs) that are the focus of the projects reviewed, and how the landscape of 44 reviewed projects was chosen. Finally, this section outlines limitations of the review, in particular concerning the paucity of systematic research available to date.

2. *Children's reading and learning in the age of mobile technologies*. In Section 2, reading and literacy are defined, along with an overview of how these skills are acquired in LMICs in an era of technology growth. Formal, informal and intermediated learning are described as essential elements to understanding the role of learning through new ICTs.

3. *ICTs and mobiles as platforms and tools for learning*. Section 3 provides an overview of the growth and development of ICTs in a global context, and in particular with respect to the availability of

various kinds of mobile devices. Use of these mobile devices is increasing exponentially, and this offers considerable opportunities for those working on improving education and reading.

4. *Purposes of M4R interventions*. This section describes a set of six 'purposes' that were used by the landscape projects in order to justify their approach to M4R. The six purposes—formal learning and instruction; informal learning; content; training; data collection; and communication and dissemination—are described, along with a set of projects that, to varying degrees, support the purpose(s) of each M4R intervention.

5. *Design solutions: The intersection of purposes, devices and end users*. Section 5 examines the intersection of the purposes with specific devices and end users. Devices are the mobile tools that have been chosen for the interventions (e.g., smartphones or tablets). The term end user refers to the choice of target population (e.g., primary school children or out-of school girls). A design solution, then, is a way of describing how a particular intervention has been put together based on these three main parameters.

6. *Analysis and implications of the current M4R landscape*. This section considers a variety of issues that were identified in the 44 M4R projects that were reviewed, with some key findings listed for each.

    a. *Who are the M4R end users*? The majority of projects focus on children and youth, which is not surprising given that the most common purpose described above is that of formal learning in schools. Adults and teachers also comprise a large segment of the M4R landscape. Of the 44 projects reviewed, only about 10 percent include a gender-related focus.
    b. *Device types and connectivity*. Twenty percent of the landscape projects use smartphones, about 10 percent use feature phone, while over 40 percent use some simpler type of a mobile phone. Around 25 percent use tablets and/or e-readers. Other devices in use include radio, television, and micro-SD cards.
    c. *Purposes.* Six main purposes were identified among the projects, as follows: formal learning and instruction (57 percent); informal learning (34 percent); content (45 percent); training (23 percent); data collection (16 percent) and communication and dissemination (11 percent).
    d. *Language.* About 50 percent of the M4R projects made explicit reference to the use of local and indigenous languages (beyond official and international languages), which seems to be a result of the movement to teach reading in the child's first language.
    e. *Intellectual property rights and open systems.* The present M4R landscape showed that only 16 percent of the projects were explicitly 'open source' in their approach, which is in contrast from the common discourse about open resources in the ICT4D space.
    f. *Costs and 'total cost of ownership.'* Little attention has been given to cost, mainly due to the donor-driven nature of M4R projects.

g. *Partnerships and organizations*. About 10 percent of the projects are supported and run by local NGOs, but the large majority of projects are broader partnerships sustained by external funding agencies, most often in conjunction with local NGOs.
h. *Supply and demand*. Many donor agencies and governments seem focused on driving up the supply of M4R applications, with less concern for the longer-term demand, which directly impacts sustainability.
i. *Evidence and M&E*. Only one M4R project contained an adequate randomized control trial (RCT) impact evaluation design. Evidence and M&E are among the biggest challenges to the M4R domain.
j. *Sustainability, replication, scalability*. Many interventions fail at the point of implementation into a specific cultural context. This is sometimes due to the initial sense of excitement that draws stakeholders in during the planning and design phases, which can fade when there is a lack of sustainability leverage to keep projects moving forward.

7. *Conclusions: Looking ahead*. Many creative ICT interventions are taking place, and the use of new, powerful and portable M4R interventions will lead to new opportunities. Some of these interventions focus on increasing inclusion of diverse populations, others focus on creating content that will provide better opportunities to scale up projects, while still others expand beyond the confines of reading development to include broader sets of skills and empower users, giving them greater motivation and increasing their capability to learn. There remain critical challenges in this field, such as the lack of solid evidence of effectiveness, a continued dependence on external funding, and overuse of supply-side approaches to design solutions. It is further suggested that speculation around the future of M4R work may be seen in terms of micro- and macro-level analyses, along with such considerations as multilingual instruction and intergenerational approaches to M4R design solutions. Finally, research is needed, both on types of mobile platforms (cell phones, smartphones, tablets, etc.) as well as on the kinds of software solutions and learning content appropriate for diverse children from low income backgrounds. Overall, there is little doubt that M4R work will continue to grow, along with mobile ubiquity and mobile learning around the world.

1. Introduction

a. Overview

In recent decades, significant gains have been made in low-income countries toward reaching the international educational goals of access and equity. Many of the world's poorest countries have dramatically increased the percentage of children now in school. Educational advances are especially significant for girls, whose rate of school participation in many low-income[1] countries has expanded greatly in recent years. The number of schools has also greatly increased, as have the types of technological and digital educational resources found within schools.

Nevertheless, while millions more children are now being schooled compared to years past, there is growing evidence that the quality of their education is so low that they are not even learning how to read properly. In Uganda, for example, about 90 percent of children are enrolled in primary school, but more than half of these students drop out before they complete primary school.[2] One recent reading assessment study found that the majority of rural third graders could not read a single word (Gove & Cevich, 2010).

Today, we have learned that full, equitable access to schooling is not enough, because enrolment does not guarantee learning.[3] Substantial research in reading and learning has led to a new phase of development, where empirical science and innovation is beginning to have an impact on policies in ways that improve the learning achievement of children, in particular their acquisition of reading skills. Experts have many ideas on different ways to improve the quality of children's learning generally, and reading in particular. This landscape review considers a growing, but still nascent, area that has various names, but one broad purpose—the use of new mobile technologies in ways that support the acquisition of strong reading skills.

b. Landscape research review: some definitional boundaries

Landscape reviews typically try to cast a large net around work that has relevance to the topic at hand, while research reviews normally focus on work that has been the subject of empirical studies. The combination of landscape research contains a tension, therefore, between breadth and depth. This is particularly appropriate for the domain of *mobiles for reading*, since many interventions are springing up worldwide, while at the same time there is a dearth of empirical research on this topic. The challenge addressed in the present document is to effectively draw on the breadth and depth of the existing literature so as to create a coherent picture of what has been done, as well as a sense of what is likely

[1] See World Bank, http://data.worldbank.org/about/country-classifications for LICs and LMICs.

[2] http://www.unesco.org/new/en/media-services/single-view/news/stumbling_blocks_to_universal_primary_education_repetition_rates_decline_but_dropout_rates_remain_high/

[3] For a review of learning research in developing countries, see Wagner, Murphy, & de Korne, 2012.

to be successful in this domain. By setting up basic definitions, it becomes possible to provide some boundaries for what is, or is not, included in this review of *mobiles for reading* (M4R).

M4R: What is it? The use of new information and communications technologies (ICTs) to improve education has been a topic of discussion as technology has evolved throughout the 20th and 21st centuries. Radio, television, movies, computers, the Internet, mobile phones and tablets have each been expected to 'revolutionize' learning processes and the way education functions in society. This review focuses primarily on mobile technologies—ICTs that are portable, typically battery-powered, and which may be connected to cellular networks and/or the Internet. Some older technologies are included, if they provide useful evidence with implications for mobile devices, or, for example, if the mobile devices were derived from work done initially with desktop computers.

In this review, the term *reading* refers to the joint abilities of understanding and producing written language, for children, youth and adults.[4] For reasons that will be detailed in the next section, the term *literacy* is sometimes used instead of *reading* as it connotes, especially in the context of technology, a broader frame of reference—both for skills beyond reading and the increasingly important approach to learning through mobile technology (*mLearning)*. Thus, this review of M4R focuses primarily on the use of mobile ICTs designed to help children to learn to read, practice reading (*reading to learn*), and acquire a broader range of learning skills that support participation in a literate society. Many of these efforts focus on reading in the individual's first language.[5]

Where in the world? The United Nations Millennium Development Goals (MDGs) include an explicit focus on disadvantaged populations, whether in very poor countries (e.g., Yemen or Chad) or in less poor countries (e.g., India and South Africa) that have large numbers of people living in poverty. Collectively, these countries have been labeled as low- and middle-income countries (LMICs). It is within these contexts that children and youth tend to miss school or do poorly while in school. Often, these countries include multiple ethno-linguistic groups that, as a function of official curricula and teacher

[4] UNICEF's mandate, based on the Convention on the Rights of the Child, defines Rights of the Child, defines 'children' as persons between 0 and 18 years of age. 'Adolescents' are defined by UNICEF and partners (UNFPA, WHO, UNAIDS) as persons between 10 and 19 years. The United Nations General Assembly defines 'youth' as persons between 15 and 24 years of age, and 'young people' as those between 10 and 24 years of age. In addition to these definitions, each national government may have its own definition and age threshold for children, adolescents, young people and youth (UNICEF, 2011).

[5] The increased demand for multilingual competencies in the globalized workforce has fueled a growing market of language teaching programs and applications. The target audience for such programs is typically literate users interested in learning a new language (e.g., *Rosetta Stone*). In some cases, there is a secondary (often unintended) audience of low-literate users hoping to acquire basic reading skills for the first time. This review differentiates between initiatives designed to foster basic reading skills for children, youth and adults who are unable to decode, reproduce, and comprehend written text *in any language,* and initiatives specifically designed to teach a new language to a student who has already achieved these abilities in another language. Because language-learning programs are often sensitive to the processes of new language acquisition, adaptations of these programs may provide important contributions to M4R in contexts where a student's first exposure to written text is in a language different from the language spoken at home. While acknowledging the potential insights that language programs may provide in developing improved M4R initiatives in multilingual contexts, this review does not include an in-depth analysis of language learning programs.

placements, may create significant barriers to effective learning in the classroom. In some projects, it is precisely this linguistic diversity that has become the focus of M4R innovations.

Who is included? The primary focus of this review is on children who are beginning to learn to read. In some contexts, particularly in well supported environments (WSEs) in high-income countries, early reading may begin with the building of language and emergent literacy skills in the home, starting around two or three years of age, supported by caregivers, schools and extracurricular activities (including ICTs) up through adolescence (Wagner, 2011). At the other end of the continuum, especially in poorly supported environments (PSEs) in low-income countries, reading acquisition may not begin until the learner is past the age of primary schooling, if ever. The MDGs, *Education for All* (EFA) and *All Children Reading: A Grand Challenge for Development* (ACR GCD) initiatives focus on children, mainly those in primary schools. Yet, it should be understood that children's literacy development begins with language, and language acquisition begins at birth. Further, literacy is a multi-generational activity, supported in different ways by the literacy practices of adults in the children's lives. Thus, this review focuses on children (and youth), but also includes some reference to efforts to promote M4R for adults, particularly women with young children.

How do we know? This is a landscape *research* review. Research that can be used to create policy depends on its credibility, which means that well-trained scientists and experts must be able to reach consensus on the methodological merits of a particular set of findings, even if they might disagree with the interpretation of these findings. Unfortunately, research (including monitoring and evaluation) is not yet a major focus in the M4R space and only a fraction of M4R projects in LMICs include rigorous research or M&E components. Many project leaders struggle to find the resources to put forward an innovative 'design solution', leaving the evaluation dimension to subsequent investigations, if the solution seems to work. What this means for the present review is that some projects could not be included due to a lack of evidence. Nonetheless, some projects that have weak or little evidence of effectiveness were included, as their innovative practices suggest that these projects would offer promising results upon which future projects could be built.[6]

Limitations of this review. While there is some discussion about user-interfaces, Internet, and device specifications, this review does not discuss the engineering of better devices. It is focused largely on low-income countries and often marginalized populations within those countries and so does not provide a comprehensive look at the global use of mobiles for reading, nor on surveys that would determine large-scale use and attitudes towards the use of mobile devices.[7] The projects reviewed here were suggested by a network of colleagues around the world and also found through research, and necessarily cannot

[6] In terms of selection for this review, an initial list of projects was provided by USAID. After expanding the initial list through a series of Internet searches and personal communications with NGOs and key stakeholders, the Penn research team and the JBS ICT4E team reviewed relevant grey and white papers, published research, and project websites to determine which projects merited inclusion in the review.

[7] In recent research, UNESCO (2014) surveyed mobile phone use in Ethiopia, Ghana, India, Kenya, Nigeria, Pakistan and Zimbabwe. The study provides a useful and up-to-date snapshot of the self-stated interests and motivations of youth and adults in using mobile phones as reading devices in local contexts.

represent the totality of M4R efforts, especially as this is a rapidly changing domain where considerable amounts of work remain unpublished. Further, this review does not focus on how mobile solutions can connect with non-mobile solutions, or how efforts on reading improvement might in some ways link with other vital sectors, such as health. Finally, as noted above, there is a dearth of rigorous research in the M4R space, so this review should be seen only as indicative of trends in the field, rather than a summation of what is known.

2. Children's reading and learning in the age of mobile technologies

a. Background

Few areas of social and economic development have received as much attention as literacy and basic education. Indeed, reading is perhaps *the* core indicator of the quality of early grade education, and is an essential part of the curriculum in schools the world over. In most countries, if a child does not learn to read in primary school, this is among the most prominent predictors of future disadvantage in terms of educational, social, and economic outcomes.[8] Furthermore, the global shift toward knowledge-based economies requires more literate workforces, and reading provides a crucial foundation for further education, even though this trend may not be easily discernable in poor villages in LMICs (OECD, 1997).

b. Defining reading

Most definitions of *reading* refer to the understanding of meanings of written words and texts that allow people to communicate messages across time and distance. Making sense of written words (whether printed or digital) and communicating through shared texts with interpretive, constructive, and critical thinking is one of the central cognitive tasks that formal schooling around the world tries to confer (Wagner, Venezky, & Street, 1999). While reading and writing have traditionally been at the center of all definitions of literacy, the term has expanded in important ways, as will be described further below.

Current theories about reading remain largely based on the empirical study of the English language in OECD countries (Share, 2008). In recent decades, debates within the field of reading science have focused on understanding how English language reading is acquired. Only a modicum of work has been done on other (mainly European) languages, with much less research on non-European languages in developing countries. Thus, present theories of reading may not be fully appropriate or applicable for contexts in LMICs with distinctive, and often multiple, languages and orthographies and linguistic boundaries are now expanding (Perfetti, 2003; Snow, 2008; Wagner, 2011).

Generally speaking, global studies of early reading development have supported the view that there are five essential components to reading acquisition: the alphabetic principle, phonemic awareness, oral reading fluency, vocabulary, and comprehension (U.S. National Reading Panel, 2000; August & Shanahan,

[8] For example, analyses of job requirements in the United States between 1969 and 1998 showed a decrease in routine manual labor skills and a corresponding increase in skills related to problem solving and communication (Levy and Murnane, 2004).

2006). These components form the scientific foundation for many global instructional interventions and reforms in educational practices in curriculum, instruction, and assessment. The five components are also central to the current deployment of Early Grade Reading Assessments (EGRA) in developing countries, and thus comprise a core part of the USAID's goal to increase early grade reading among poor populations.

The fifth component, reading comprehension, is considered to be the heart of becoming literate. This complex process is influenced significantly by vocabulary knowledge and instruction, the thoughtful interaction between reader and text, the abilities of teachers to equip students with appropriate reading strategies, and the informal possibilities of interaction with the literate environment. The effective use of reading strategies becomes more important as texts become complex and children's goals for reading expand. Instruction in the early grades helps children learn to read mostly by decoding words in print, but by second grade in WSEs, and later on in PSEs, children are taught to read to learn for a variety of purposes (Chall, 1996).[9]

When children learn to read in a language that is not their mother tongue—as in the contexts of LMICs with many local languages and dialects—they are at a particular risk for failing to develop reading comprehension skills. For many decades, educators and others have debated the nature and acquisition of second language reading. Some contend that if a child speaks more than one language at home, he or she might have to deal with 'linguistic confusion;' others debate whether learning to read in a second language should come earlier or later in the school curriculum. Added to this debate is the tension associated with language choice in countries where the role of languages may be contested. Although these debates are beyond the scope of the present review, M4R in a person's first language (L1) and second language (L2) is very much part of the present discussion, because so many children in LMICs are forced to deal with this multilingual reality (Snow and Kang, 2006).[10]

c. Redefining literacy in an era of technology use

Another approach to reading acquisition focuses more on the social practices of literacy, namely, how literacy is used in formal and informal contexts (Street, 1999; 2001). From a socio-cultural perspective, literacy practices must be understood in their own particular cultural context. Thus, when, for example, a child holds a book or a smartphone with the purpose of reading, this common 'practice' may lead to

[9] Also, some observers have remarked that children who are immersed in an L2 context without adequate educational support or guidance mimic the sounds of language in an attempt to gain social acceptance from teachers and peers, without comprehending the meanings of words. In this case, repeating text is nothing more than memorization, and writing letters and characters is simply copying and scribbling (Chall, 1996).

[10] Beyond the politics of language choice and bilingual education, a growing science exists that encompasses both the social and cognitive dimensions of learning to read in more than one language. To what extent do skills acquired while learning a first language (orally or in written form) transfer to a second language? Over the years, the preponderance of research findings tends to support the 'additive' or 'interdependent' notion that L1 language and reading skills generally enhance L2 language and reading skills. Yet, there are many unresolved issues. When should teaching of L2 reading begin, and should that co-occur with curricular content in L2? These are issues of relevance to M4R as well.

different outcomes with particular implications for reading. That is, each specific tool may be utilized differently depending on the user's intent and the device's design and capability. With a book, the child might be reading a short narrative text; with a smartphone, she might be doing the same, or she might be sending an SMS. What would look like similar actions may be quite different practices, with quite different impacts on learning. One of the key distinctions in this review is between learning how to read (with its emphasis on the acquisition of component skills), and reading to learn (which mainly involves comprehension of textual materials).

There is growing evidence that the *ways* that ICTs are utilized is also changing the nature of learning processes themselves. Observational studies indicate that young learners in wealthier communities actively use websites, message boards, social media and so on. If given a choice, they often prefer social interaction on the Internet or mobiles to listening passively to an instructor or reading a textbook (Hinostroza, Isaacs, & Bougroum, 2012; Tolani-Brown et al., 2009). Others have found that reading skills themselves are significantly impacted by continuous interaction with web-based literacy programs (Leu, O'Byrne, Zawilinski, McVerry, & Everett-Cacopardo, 2009). In other words, ICTs are changing the ways that learning takes place, what gets learned, and not just standard reading outcomes. With the advent of e-books and social media, it is clear that young children with access to mobiles already have many new opportunities and ways to learn to be literate. In addition, given that mobiles provide a 'lower barrier'[11] of opportunity for children to create texts themselves, they can write their own texts, rather than simply consuming them.

d. Formal, informal and intermediated learning—increasing time and space with M4R

Learning occurs in quite diverse and contrasting ways. For example, *formal* learning practices—such as the Western pedagogical approach used in schools across the world today—are mostly designed by a specialist of some kind (e.g., an instructor, a textbook publisher, a minister of education official). By contrast, much of what we learn is not consciously designed for the specific purpose of learning. There are also *informal* learning practices,[12] for example, when children interact with family members and other children, or note visual signs marking streets and stores. In an era when people of all ages are using mobile technology, there is little doubt that these new tools have already become part of the informal spaces where learning takes place. In this review, both formal and informal learning practices are embedded in a wide array of projects under the M4R umbrella.

One key implication of increased use of mobile devices is the amount of additional time and space created for learning. For example, the traditional use of time for learning in schools changed very little with the advent of computer labs. Much more time is potentially gained when mobile devices can be used outside of the classroom, after school hours, in leisure time, and in the home. Whether this extra time and space is utilized for 'sanctioned' learning (from the educator's perspective), or as 'wasted', by

[11] The reference to lower barrier refers to the relatively easier way to publish texts in digital form, whether as SMS texts, blogs or even longer narratives. This phenomenon is already evident in the M4R domain.
[12] For a recent review of formal and informal learning, see Wagner et al., 2012.

playing diversionary games, is a matter for researchers who study the use of mobiles. Part of the conundrum of providing mobiles (or any other media device) for development is whether it will be put to 'good' or 'bad' use, and how to define 'good' or 'bad.' For example: if a student is using her phone to SMS a friend in a Kenyan classroom, the teacher may be upset at the diversion of attention; but if the text is in English, and supports L2 literacy, there may be an upside as well. Similarly, whether the cognitive consequences of the use of ICTs have positive or negative impacts is often unknown.[13] Judgments regarding the pros and cons of using mobile devices are part and parcel of everyday public discussions across the world.

Finally, there is an oft-ignored aspect of mobile use that has been called 'intermediated' learning that enables low- and non-literate individuals to benefit from mobiles through digitally-skilled users (Sambasivan et al., 2010). In other words, skilled users act as *surrogates* for illiterate recipients. A good example of intermediated learning is when someone asks a skilled reader to read a text from her mobile. Of course, this sort of intermediated learning has existed for centuries using printed materials; the difference today is that there is greater accessibility to more and more diverse digital resources, and with rapidly changing mobile devices, it is not unusual to find active intermediaries performing varied roles.

3. ICTs and mobiles as platforms and tools for learning

a. Background

ICTs include a wide variety of possible devices, platforms and communication pipelines for the transfer of information of all kinds. Increasingly, even in the world's poorest countries, interest in the use of ICTs for development (ICT4D) is growing dramatically. Indeed, there is a steep growth in spending on ICTs across the globe (see **Figure 1**),[14] and this growth will inevitably have a serious impact on the contexts and processes of education in general, and learning to read in particular.

Even those M4R (and broader ICT for literacy) efforts that have been deemed successful in terms of reaching the 'end user' are not sufficiently focused on learning among diverse and marginalized populations in low-income countries.[15] For example, the vast majority of software and web content (mainly in major languages such as English, Chinese, Russian, French, Arabic and Spanish) is of limited learning use to millions of people in LMICs who do not speak any of these major languages.

What would accessible ICT-based learning tools look like? ICTs have been used in education for a much longer time than is usually thought, going back to the days of distance education through radio, including

[13] See, for example, Foehr (2006), on the perils of multi-tasking, or intensely using Google (Carr, 2008).
[14] The cited report included a small decline in investments in 2008-2009 due to the recession, however investments have continued to increase since then.
[15] According to Hinostroza et al., (2012), government ICT policies often tend to use a 'one-size-fits-all' strategy that limits attention to diversity.

the intensive use of radio in basic education over the past several decades.[16] Of course, the revolution in new technologies—based on the rise of the personal computer, the Internet, mobile phones and other handheld devices—has captured both the imagination and funding for a variety of new efforts in ICTs for learning. It is clear that user-friendly and multilingual ICT-based products are increasingly gaining interest, with mobile phones being one key example.

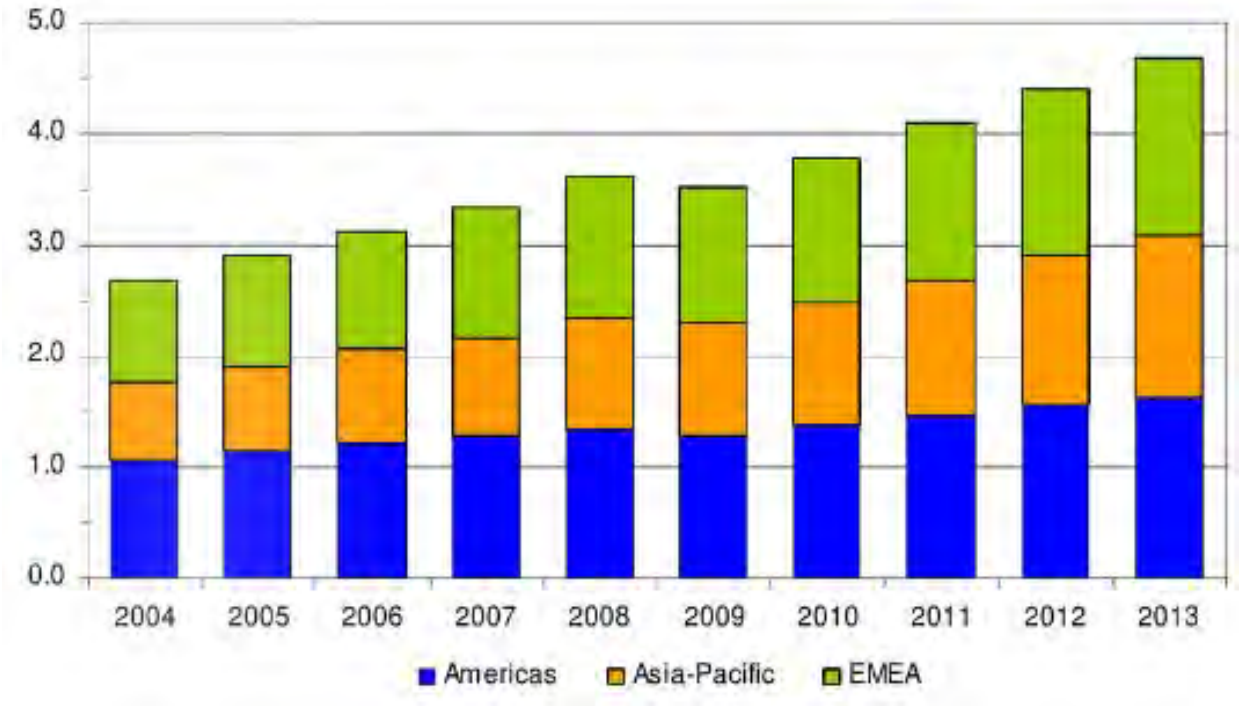

Figure 1. Growth of ICT spending by region (in US $trillions)[17,18]

Even with the growth of M4R interventions, it is important to dispel the notion that using ICTs for learning (and literacy) is an easy endeavor. There was an early enthusiasm for 'closing the digital divide' in the U.S. and around the world, but the typically one-size-fits-all developments did not take into consideration the needs of diverse users (U.S. Department of Commerce, 2002). This notion has given way, fortunately, to a more nuanced approach to the end-user utility of any M4R intervention. The question becomes: What problem is this 'solution' trying to address, and for whom? Is the solution culturally and ecologically accessible to the target population? Can practitioners leverage their own skills and existing technologies with even better solutions? When is it appropriate to introduce technology into a setting that might overthrow previously well-adapted non-ICT systems? These are the difficult questions but they will need to be addressed if substantive advances are to be made.

[16] See Hinostroza et al. (2012) on interactive radio instruction.

[17] EMEA - Europe, the Middle East and Africa

[18] Due to the small size of the Middle East and Africa ICT markets relative to other regions, these markets were aggregated with Europe for this graphic (IHS Global Insight, 2010).

It is fair to say that the dramatically increased interest in ICTs and mobiles for learning has not yet fostered a sufficient scientific research base.[19] Indeed, there has been a troubling tendency to overstate the predictions and findings on outcomes. Some of the best-known initiatives, such as the *One Laptop Per Child* (OLPC)[20] or the *Hole in the Wall*, do not have empirical research support (Cristia, et al., 2012; DeBoer, 2009; Hinostroza et al., 2012; Nugroho & Lonsdale, 2010). To date, ICT for learning resembles other areas of educational reform—a fairly long initial period of trial and error, followed by slow, incremental change as the research base develops. It is important to keep in mind that the rapid changes in ICTs over the past decade have made the evaluation dimension unusually difficult. Often, by the time an evaluation study is underway or completed, the ICT platform (phone, tablet, or software) may have changed so much that the study is no longer relevant.[21] This type of rapid change has added to the difficulty in designing and understanding M4R interventions of high quality.

b. Growth of the use of mobile devices

People began using mobile phones more than a half-century ago, after the U.S.-based Bell Labs developed a system to allow users to place and receive telephone calls from automobiles, leading to the inauguration of mobile service in 1946. However, it was not until 1991 that companies began to sell handheld cellular phones (GSM and CDMA) to the public in increasing numbers. The growth from that time onward has been exponential across the globe (see **Figure 2**), even among the poorest populations in the world. Furthermore, the more recent growth in smartphones and tablets suggests that in the next year or so, these will being to exceed the used of installed personal computers (**Figure 3**).

[19] In an oft-cited, but now somewhat outdated, review on ICTs and education in American schools, Cuban (2003) found that the impact of information technologies on educational improvement was overrated.

[20] Annex B, project summary 24.

[21] One example of this would be the OLPC laptop, which had a shelf-life of about six years, but has few takers in the current move toward mobile devices (see Annex B, project summary 24).

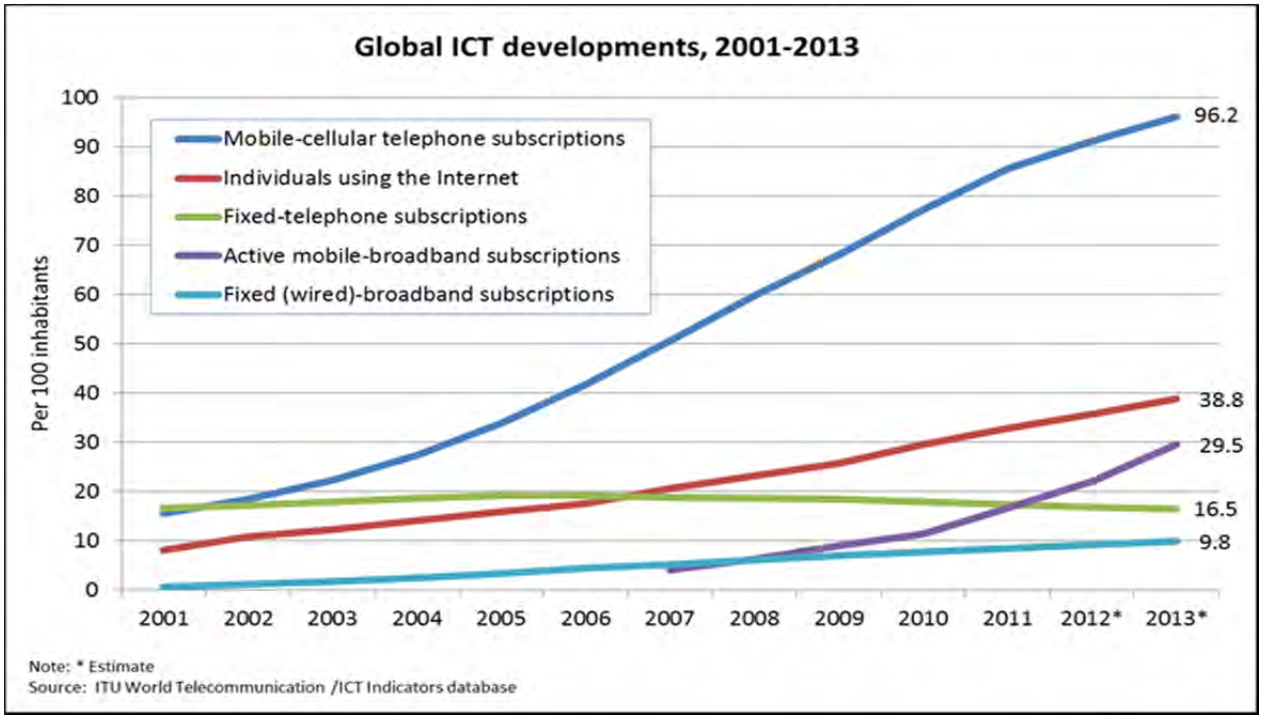

Figure 2. Growth of mobile phones (Source: ITU website)

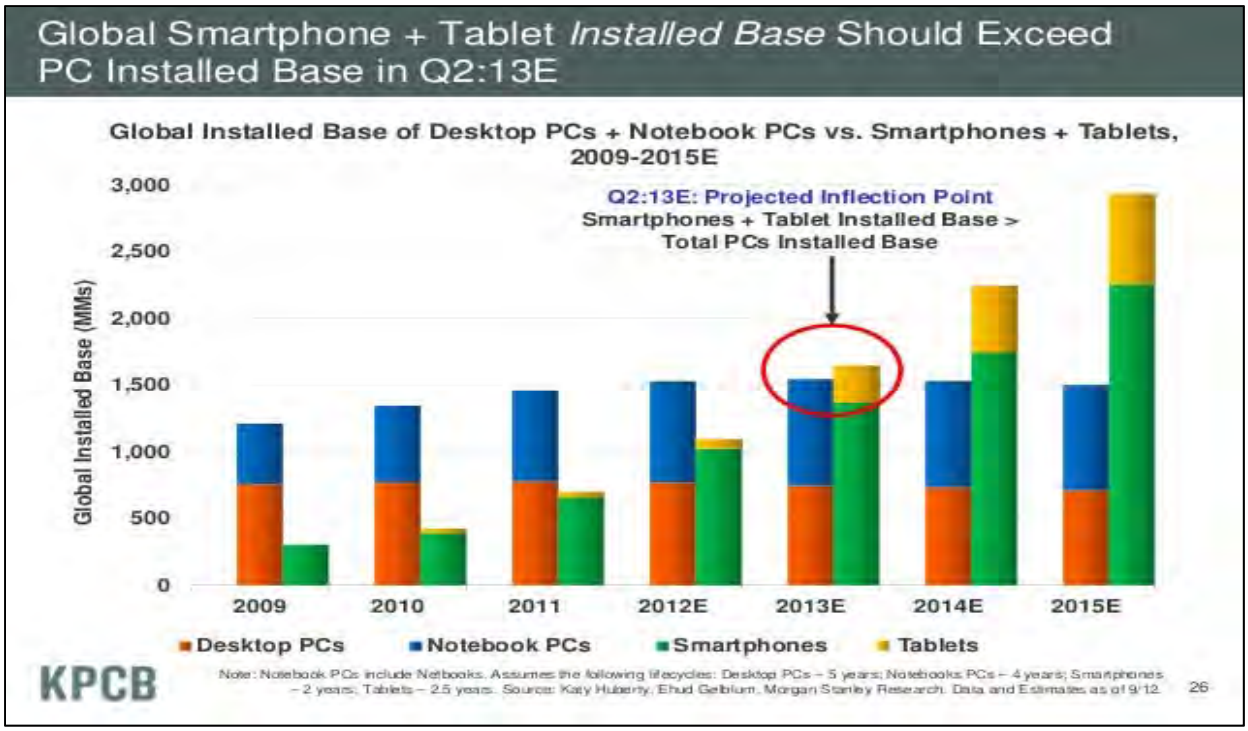

Figure 3. Changes in use of PCs, phones and tablets, 2009-2015 (projected). (Source: http://www.kpcb.com/insights/2012-Internet-trends-update)

c. Mobiles, m-learning and literacy

There is little doubt that ICTs will increasingly be deployed for education in developing countries, but what does this mean for learning and literacy? First, it acknowledges the key difference between making computers, the Internet and handhelds *available* versus identifying strategies to achieve defined learning *outcomes* through the use of ICTs. Many initiatives have made hardware solutions available to schools, but lack of learner-appropriate content and other problems have meant that these initiatives had little learning impact (Hinostroza et al., 2012; Wagner, 2005). Second, it is important to distinguish among the range of contexts where mobile learning may occur—much of the use of technology is outside of school, and this will likely continue. Third, there is growing evidence that the ways children and youth utilize new technologies is changing, with increased engagement and collaboration (Dede, 2009; Leu et al., 2009). A number of the current M4R learning devices are shown in **Figure 4**.

Figure 4. Common types of contemporary mobile devices in 2010

Given the large investments that are now being made in the ICT for learning area (Hinostroza et al., 2012), there is an urgent need to build a stronger evidence base. It is also clear that there are spaces in which *m-learning* (using mobile devices for learning) has become much more variegated in recent years, so that it is not always clear what is meant when that term is used. Indeed, there are likely to be serious debates about such definitions. In a prominent recent publication, it was stated that: "mLearning is the ability to access educational resources, tools and materials at anytime from anywhere, using a mobile device," (GSMA, 2010, p. 6) as shown in **Figure 5**. According to the approach of the present review, having 'access' is inadequate, as the focus should be on learning, reading and broader literacy skills. Simple access will do little to directly make a positive difference.

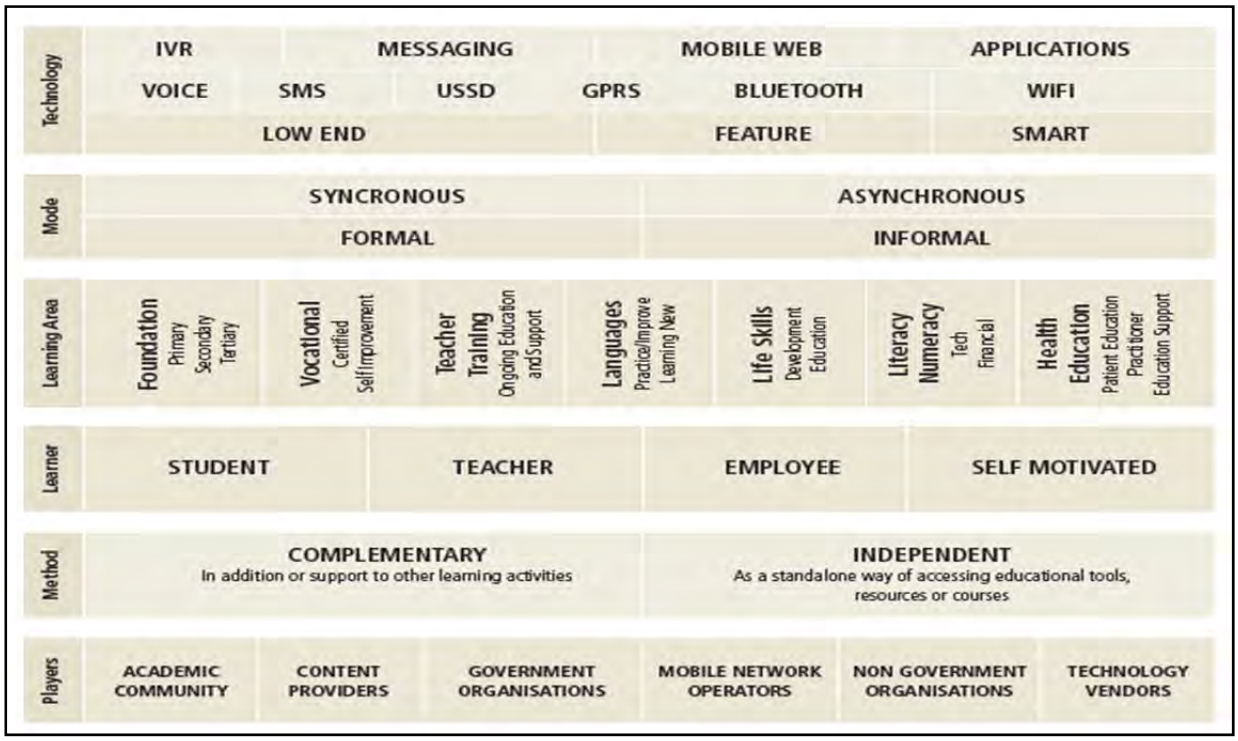

Figure 5. Learning framework[22] (Source: GMSA, 2010)

But what would the evidence look like beyond mere access? The ability to distinguish between the effective uses of technology is no easy task. To date, many of the claims around impact have relied on pilot data focusing on inputs rather than outcomes. However, without a clearly articulated research question explicitly linked to a viable theory of change, pilots can do little to advance science.[23] By contrast, development efforts excel in their commitment to formative evaluation that ensures an

[22] IVR is Interactive Voice Response. USSD (Unstructured Supplementary Service Data) is a protocol used by GSM cellular telephones to communicate with the service provider's computers. GPRS (General Packet Radio Service) is a packet oriented mobile data service on the 2G and 3G cellular communication.

[23] The U.S. Department of Education's Institute for Education Science (IES) provides a concrete reference for determining when an intervention is ready for independent evaluation. IES employs a multi-tiered granting mechanism categorized into five research goals, for funding of up to five years: Exploration, Development & Innovation, Efficacy & Replication, Effectiveness, and Measurement. Grants funded under the Effectiveness or Measurement research goals have two distinguishing characteristics: the researchers must be removed from implementation efforts (independent) and sufficient evidence must be demonstrated to show that an initiative is ready for an upscaled impact evaluation of learner outcomes. Only with sufficient justification beyond the scope of the initial research goals are concepts considered for funding under the final two research goals. See IES website at: http://ies.ed.gov/funding/. In contrast, foreign assistance pilot interventions rarely exceed a two-year funding period and generally anticipate evaluation findings within a limited timeframe and minimal resources. See *All Children Reading* (ACR) pilot funding mechanism at: http://allchildrenreading.org/apply. Time and resources are required for rigorous and independent evaluations. This is especially the case when considering interventions that incorporate new technologies as the primary solution since they generally require a higher unit cost per learner (Adkins, 1999; Paterson, 2006). Thanks to Matthew Kam, Senior Technology Strategist, American Institutes for Research for this insight.

ongoing monitoring process. Information collected from monitoring can provide real-time data for program planners to make the necessary adjustments to instruments and other project components.

Some believe that the long-term implications for the use of new technologies are profound, both for the delivery of literacy education and for a new vision of what it means to be literate in a world that has been fundamentally transformed by technology. Technological developments could offer new tools to help meet the goals of education improvement, poverty reduction, gender equity, and improved child and maternal health. Or, they could create new disparities between rich countries and poor (Wagner & Kozma, 2005).

Another way to look at mobiles and literacy focuses on increased ability to access, analyze, evaluate, communicate and use information to solve problems, create new knowledge and foster collaborative learning. Further, the fact that mobiles allow for much greater informal learning (outside the class-room) dramatically expands the possibilities of learning 'outside the box', literally speaking. From this m-learning perspective, mobiles are not just a means for delivering literacy skills but also an integral part of an information-literate society and knowledge economy. Individual participation in a globalizing world not only involves text literacy skills but also necessitates skills that use technology as a means to access, disseminate and create new information and knowledge products for the benefit of the individual and society.

d. Policy implications

At one level, the policy implications for proponents of M4R are relatively straightforward: Are the expenses associated with providing the hardware, software and delivery infrastructure for literacy learning less than those required to provide this training by some other means? Or, if they are not less expensive, are technology-based means more effective than traditional means (e.g., teacher training) and sufficiently so to justify the added costs? These are straightforward questions that can be answered easily if credible evidence is available, which is largely not the case.

In addition, there are many other policy issues that need to be considered. Take the area of privacy and ethics, for example. The potential unification of personal information records with student reading scores for the purpose of monitoring, evaluation and responsive or individualized educational interventions has led to both intrigue and fear in the American education system. How will this be deployed in LMICs, and with what sorts of consequences? Unauthorized access to personal information can lead to shame, embarrassment, marginalization and stigmatization, and can affect an individual's future employment and educational opportunities. While such innovations offer the exciting potential to improve student learning, there are still concerns about the protection of sensitive data, and, in the context of this rapidly changing technological climate, there are important legal and ethical implications that warrant further analysis. In considering M4R initiatives, it is important to consider distinct privacy regulations and ethical standards in each country, and the potential need for international standards to ensure the protection of privacy.

4. Purposes of M4R interventions

The present M4R landscape is comprised of an ecosystem of projects and ideas that are, for the most part, untested innovations. Indeed, reviews of M4R projects more than five years old have mainly lapsed into irrelevance or antiquity. As such, many of the projects described in the Project Summaries (Annex B) are pilot projects and projects that may not be research-based.[24] There are some exceptions, but only 18 percent of projects (8 out of 44) were deemed to have credible external or research-based evaluations.[25] Nonetheless, what is required with such an early and fragmented field is a way to conceptualize findings as they begin to appear. One way to achieve this is to understand the main *purposes* for M4R interventions, where purposes are defined as the goals and objectives that the intervention aims to achieve.

Purposes are sometimes explicitly stated, while at other times only implicit in the reports available. Each of the six purposes below incorporates a different perspective of the roles that the implementers had in mind, as much as could be inferred from their reports. Many interventions do not fall exclusively within a single purpose.[26] Indeed, some combine two or more purposes within a single intervention. However, the guiding metric for the present classification focuses on the perceived *primary* purposes of the intervention. The projects referenced below can be found in the Project Synopsis Chart (Annex A, along with project numbers in brackets below) with further detail provided in the Project Summaries (Annex B).

a. *Formal learning and instruction*. This type of intervention is best characterized as intentional or directed learning, whether inside of a formal school setting or in non-formal education (NFE) programs.[27] Formal learning and instruction (FLI) incorporates guided inquiry through clearly planned learning objectives in a structured format (usually experienced by the end user through modules or units). While the end user for this type of approach is generally referred to as a 'student' in project documents, the formal learning process does not necessarily need to be in a school classroom setting—rather, it could be FLI on a mobile phone at home or in the community. Interventions within FLI may focus on acquisition of new knowledge and skills (such

[24] Given that there are neither accepted standards nor benchmarks for measuring success of M4R, it is not surprising that the research base remains very limited.

[25] Projects with 'credible external' evaluations include project summaries in Annex B: 2. *Project Alphabétisation de Base par Cellulaire (ABC)*; 9. *Bridges to the Future Initiative (BFI) – South Africa*; 16. *Interactive Radio Instruction (IRI) and Interactive Audio Instruction (IAI)*; 20. *Mobile and Immersive Learning for Literacy in Emerging Economies (MILLEE)*; 30. *PlanetRead*; 37. *Somalia Interactive Radio Instruction Project (SIRIP)*; 39. *Tangerine/TangerineClass (Beta version)*; and 43. *Worldreader*. The term 'credible external' is defined in terms of explicit description of evaluation methodology and data analysis, along with information on whether the evaluation was undertaken by individuals with little or no apparent interest in the outcomes. Research-based is a more flexible criterion that implies that a quasi-experimental approach (usually including a control group) was utilized.

[26] The categorization of purposes herein was done subjectively by the review team, based on the information available at the time of publication. As such, projects may find fault with the purpose designations provided. The goal here is not perfect assignment, but rather to provide a useful framework for thinking about how innovations are currently taking place in the M4R field.

[27] See Wagner et al. (2012) for a discussion of contexts for learning, and the distinctions between formal and NFE learning.

as phonemic awareness or vocabulary), as with *Ustad Mobile Literacy*[28] on letter naming in Afghanistan. In addition, FLI interventions may include opportunities for students to practice their skills as they advance through directed curricula with other forms of digital content (digital stories, exercises and applications Twenty-five projects (out of 44 total; 57 percent) had FLI as a primary purpose.[29]

Box 1. *Mobile and Immersive Learning for Literacy in Emerging Economies (MILLEE)* (See Annex B, project summary 20), an example of formal learning and instruction, takes a cognitively-based approach to teach early reading, using language learning games on cell phones. In 2007-08, the learning games were implemented within an after-school program in Uttar Pradesh, so that this project can be classified as having a Formal Learning purpose. During the structured, two-hour program sessions, students were loaned cell phones that were pre-loaded with the instructional literacy games. A summative pre-test versus post-test assessment of the program in Uttar Pradesh measured learning achievement by 27 students (ages 7-14 years) in the semester-long program. The results yielded average post-test gains that were small, but "statistically significant gains that could be reasonably attributed to [the] cell phone-based English learning games" (Kam et al., 2009). Interestingly, and contrary to the initial aims of the program, the researchers found that "participants' post-test gains appeared to be highly correlated" with their pre-test scores, meaning the students with the stronger literacy skills to start with benefited more from these instructional games.

b. *Informal learning*. Informal learning (IL) covers a range of non-directed learning objectives. IL could include promoting the use of SMS experiences to support reading practice, for example in *BBC Janala,*[30] or providing local language materials on mobiles, as in *PAJE Nièta (Support to Youth Entrepreneurs Project).*[31] IL interventions offer learning materials or practices that will most likely engage the learners outside of formal learning settings, and may simply be a byproduct of other activities on their mobile devices (e.g., using *M-Pesa* on mobiles for banking in East Africa) (Jack & Suri, 2010). In other words, IL includes a fairly wide variety of innovations that attempt to engage the learners in behaviors and activities that may have additional consequences for learning. Fifteen projects (34 percent) had IL as a primary purpose.[32]

[28] See Annex B, project summary 42.
[29] See Annex B, project summaries 2, 4, 5, 8, 9, 10, 11,12, 13, 16, 18, 20, 21, 22, 25, 26, 27, 29, 31, 33, 34, 36, 37, 40 and 42.
[30] See Annex B, project summary 6.
[31] See Annex B, project summary 26.
[32] See Annex B, project summaries 19, 23, 24, 30, 41.

Box 2.The *Using Mobile Phones to Accelerate Literacy Education and Empower Afghan Women* (see Annex B, project summary 41) program, an example of *informal learning*, is run by Afghan Institute of Learning (AIL) to promote basic literacy among women in rural Afghanistan. The pilot utilizes mobile phones to support and accelerate learning in a course redesigned to complete the AIL Fast-track Literacy Curriculum in just four months, as opposed to the typical nine months. The pilot featured teachers sending daily texts to students, who read the incoming message and responded via text message, demonstrating reading comprehension and writing skills. This project is classified as an "informal learning" program, because the text messages are conversational and take place as a supplement to, but outside of, the formal learning structure. For evaluation purposes, 50 female students (ages 14-32 years) were selected from two educational centers in rural Afghanistan. Researchers noted that incorporating cell phone training into course material generated excitement among students as literacy became not an "abstract skill" of alleged importance, but a growing, tangible skill which could bring the students to "another level of understanding of the world around them." Quantitative results revealed that the program more than "halved the time in which students were able to attain the literacy" growth previously gained in AIL programs (Yacoobi, Lovelace, & Magrab, 2012). Unfortunately, the M&E design did not provide adequate detail to determine credibility.

c. *Content.* Some M4R interventions begin with the premise that a lack of textbooks and reading materials (and/or a lack of age-appropriate text materials in local written languages) leads to low-literacy environments that are not conducive to the development of reading skills. Interventions that provide e-books pre-loaded with stories at varying levels of difficulty, such as *Worldreader,*[33] are now becoming more commonplace for these reasons. Others, such as *PlanetRead* in India,[34] focus on the practice of reading (building up literacy practices) and tend to supply content in local or second languages. In addition, some reading materials include educational children's content, as is the case with *the Radiophone Project* in India.[35] Twenty projects (45 percent) listed content as a primary purpose.[36]

Box 3. *Worldreader* (see Annex B, project summary 43), an example of *content*, was launched with Amazon support, with a mission to "make digital books available to all in the developing world" (Worldreader, 2012). As of February 2013, the organization has delivered over 441,000 e-books to Kindles in the hands of 3,000 children and teachers in sub-Saharan Africa. The organization also works with African publishers to make locally produced content available through their e-reader programs. A study was conducted during 2010/2011 on a purposive but small "sample of 481 students in nine project-affected schools" in Ghana (Worldreader, 2012). The report indicated that there had been an "increased enthusiasm of students towards reading" (p. 6) as well as a boost in regular access to reading material. However, these results were obtained from interviews and counts of books pushed or pulled to devices. There was no way to measure true engagement with the text to verify how much students were actually reading or learning. Literacy gains found by this study were minimal. There was an incremental increase in reading ability measured for primary level students with e-readers compared to the control, but differences were not significant at junior and senior high levels (Worldreader, 2012). One notable impediment to this project is the fact that 40.5 percent of devices broke and needed to be replaced during the one school year trial study.

[33] See Annex B, project summary 43.
[34] See Annex B, project summary 30.
[35] See Annex B, project summary 32.
[36] See Annex B, project summaries 1, 2, 4, 6, 7, 12, 17, 20, 23, 24, 26, 30, 32, 34, 35, 36, 37, 40, 43 and 44.

d. *Training*. Training interventions (usually part of teacher professional development, but also designed for facilitators or parents) contain direct or guided instruction for adults who serve as intermediaries for children's learning. The main purpose of M4R-supported training is to enhance the pedagogical skill of the teachers, most often by introducing them to new curricular or instructional content (such as lesson plans), as with *Across Radio* in South Sudan,[37] and the *PHARE Program (Programme Harmonisé d'Appui au Renforcement de l'Education)* in Mali.[38] Ten projects (23 percent) had training as a primary purpose.[39]

Box 4. *Package for Improving Education Quality (PIEQ)* (see Annex B, project summary 29), an example of *training*, aims to improve French and math learning in the Democratic Republic of the Congo (DRC). PIEQ aims to build the capacity of teachers, schools, and communities through workshops for teachers and community members and direct instruction to students based on Interactive Radio Instruction (IRI). To address teacher training needs, *PIEQ* delivered support to over 27,000 primary school teachers in three provinces (EDC, 2011). The project emphasized teachers' knowledge in their subject area and skills in student-centered, inquiry-based teaching. *PIEQ* delivers lessons directly to students through IRI, with lessons to: (1) ensure high quality instruction for children, and (2) provide support to teachers in practicing the interactive techniques they learn in training. The program also engages community members, to encourage them to play an integral part in improving learning for their children. *PIEQ* also trains parent groups in advocating for, planning and implementing school improvement projects.

e. *Data collection*. With increased emphasis on accountability in all development work, some M4R projects focus on the rapid assessment of individual and cluster-level learning gains in reading.[40] The purported benefit of such technologies is real-time monitoring of what the student knows and does not know, and where to focus instruction efforts, such as in the work of *eEGRA* in Mali and the Philippines[41] and *Tangerine/TangerineClass (Beta version)* in multiple countries.[42] Some, such as *MILLEE* in India[43] and *PAJE Nièta (Support to Youth Entrepreneurs Project)* in Mali[44] focus on the science of reading acquisition (Snow & Kang, 2006; Snow, 2008; Gove & Cvelich, 2010). Overall, relatively few projects reviewed have invested in measures of learning outcomes, or have reported them as an impact variable.[45] In some projects, the backend systems are capable of collecting information on the actual use of the learning devices, as is the case with *Worldreader,*[46] where use of phones and texts are monitored and collected by Amazon, and then

[37] See Annex B, project summary 3.
[38] See Annex B, project summary 28.
[39] See Annex B, project summaries 3, 11, 16, 21, 27, 28, 29, 31, 35, and 39.
[40] The move toward 'smaller, quicker, cheaper' or SQC assessments has also played a role in helping to streamline and support M4R data solutions (Wagner, 2011).
[41] See Annex B, project summary 14.
[42] See Annex B, project summary 39 and 40.
[43] See Annex B, project summary 20.
[44] See Annex B, project summary 26.
[45] Projects focused on literacy practice seldom explain how more text inputs (such as more texts provided) are indicative of an increase in reading outcomes. One of the fallacies of the 'literacy environment' approach to reading is the notion that more books will produce more reading and better reading skill. This may be true some of the time, but clearly much depends on the types of reading materials provided and the motivation to read (Wagner, 2010).
[46] See Annex B, project summary 43.

used for analysis and planning. Seven projects (16 percent) had data collection as a primary purpose.[47]

Box 5. RTI International's *Tangerine/TangerineClass (Beta version)* project (see Annex B, project summary 39), an example of *data collection*, uses an open source platform on mobile devices, including netbooks, tablets and smartphones, to record student responses to early grade reading and mathematics assessments (such as EGRA/ EGMA). As of March 2013, *Tangerine* has been deployed in more than 19 EGRA/EGMA implementations, in 13 countries, by 6 different organizations. The project highlighted the benefits of tablet over paper administration of assessments due to reduced time to data analysis, reduced human errors, and cost-benefits for large-scale, repeated administrations. Electronic administration also reduces paper costs and usage, which, in large-scale assessments, is significant. Materials available on the project's website emphasize the importance of carefully training test administrators, especially training inside schools. While designed with EGRA and EGMA in mind, the platform can be customized and used for different types of assessments, thus makes the application useful for multiple languages and formats of these assessments while also allowing further customization for classroom-based assessments (Strigel, 2011).

f. *Communication and dissemination*. Finally, there is a set of innovations that attempt to harness the power of M4R solutions to engage in social exchange and quick delivery of information. The former may not explicitly emphasize literacy as a direct objective, but can allow end users to engage in active dialogue, where literacy and language skills are practiced informally, as is the case with the *Using Mobile Phones to Accelerate Literacy Education and Empower Afghan Women*[48] where mobile phones are used to empower women. Other programs, such as the *FunDza* project in South Africa,[49] help disseminate educational content and create social media communities that foster literacy. Five projects (11 percent) listed communication and dissemination as a primary purpose.[50]

Box 6. The *Jokko Initiative* (see Annex B, project summary 18), an example of *communication and dissemination*, is an addition to a Community Empowerment Program (CEP) run by Tostan. Tostan has been widely recognized for the progress it has made in empowering local "communities to change their own lives" through the CEP, which covers human rights, health, literacy and numeracy (Tostan, 2010). *The Jokko Initiative* adds mobile phone-based communication to the CEP to allow for additional practice with literacy skills while facilitating communication among participants. Jokko leverages a technology called RapidSMS, which allows members to send a text message to a single number. The message is then forwarded to other members of the community, allowing a simple text-based forum for discussion. A 2010 intervention study looked at the impact of the initiative in a sample of 20 villages. Participants were surveyed at the start of the use of RapidSMS and again at the end of the CEP six months later, to compare changes in "cell phone usage, literacy and numeracy." The study found that the villages with RapidSMS access had a statistically significant, six percent higher average score at the follow-up on literacy and numeracy assessments than the control villages "who underwent the same training but did not have access to the SMS Community Forum" (Beltramo & Levine, 2010).

[47] See Annex B, project summaries 14, 25, 28, 33, 38, 39 and 43.

[48] See Annex B, project summary 41.

[49] See Annex B, project summary 15.

[50] See Annex B, project summaries 15, 18, 19, 22, and 41.

The six purposes encompass a broad range of projects and initiatives. **Figure 6** shows the categorization of projects by their two main purposes.[51] The largest group of projects is focused on school-based formal learning and instruction. Perhaps this is inevitable due to current national and international policy focus on schooling and learning.[52]

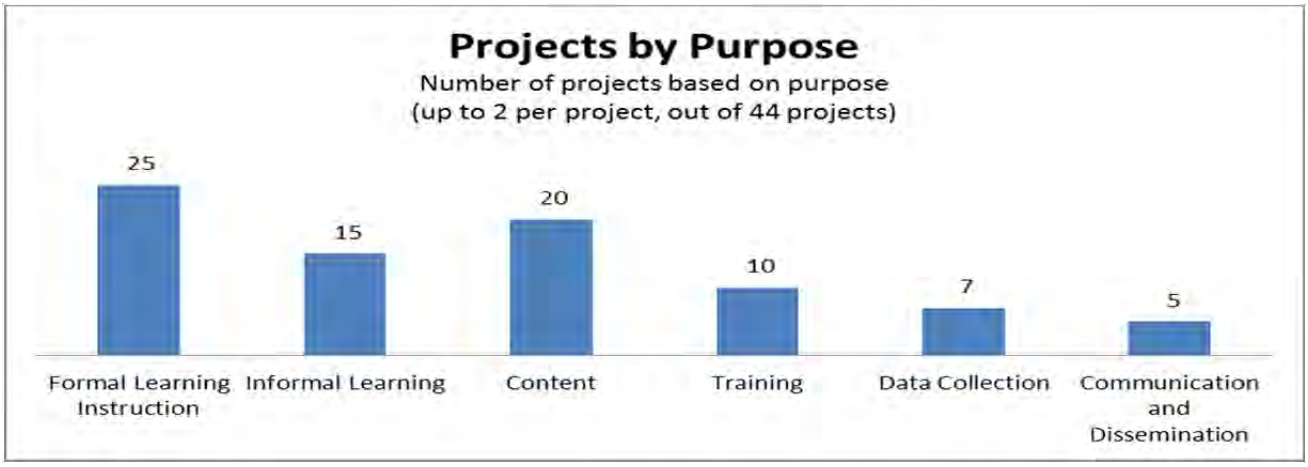

Figure 6. Projects by Purpose

The categories of purposes described above are no doubt imperfect, and are likely to change. Many projects do not fit neatly into the purpose that may have been attributed to them for this review. Nonetheless, a sense of purpose is critical to help a project find its vision, and thus an appropriate *design solution*, which is the focus of the following section.

[51] In the analysis of *purposes*, *devices* and *end users* in this report, each project is allowed to be counted only up to two times. Some projects may have numerous devices, but it would bias the results to allow one project to be 'counted' four times, when another project might only use a single device. Hence, even though projects in Annex B may list more than two devices (or users or purposes), only the primary one or two of each parameter are shown in the Synopsis Chart of Annex A.

[52] Current efforts to consider the increased prominence of learning and school quality in national and international education policy are reviewed in a recent Brookings report by Wagner et al., 2013. In the Brookings paper, substantial attention was also given to informal learning, a category that is, in this review, also a prominent feature of the landscape of purposes.

5. Design solutions: the intersection of purposes, devices and end users

The intervention purposes described in the previous section encompass the main rationales (whether enunciated or not) that project implementers have adopted in order to promote their goals. When it comes to a particular M4R design choice, however, it is necessary to think in terms of two additional parameters: (a) devices that are available, adaptable, and affordable and (b) end-user characteristics, or who will actually use the devices. Design solutions are the nexus of the purpose, device, and end users, as seen in **Figure 7**.

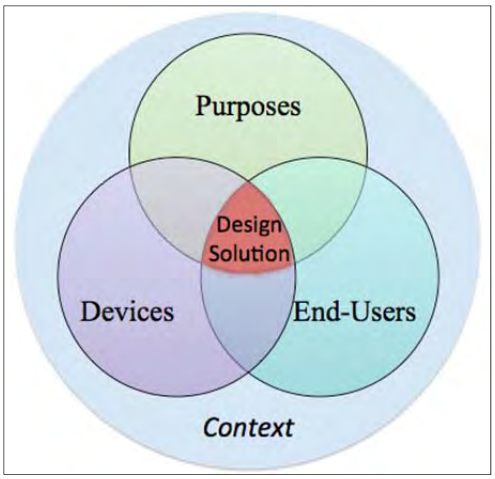

Figure 7. Design solution as a function of purposes, devices and end users

a. *Devices.* As ICT-based approaches in learning and schooling have become more prominent, there have been a number of well-known device-based implementations.[53] Two of these mentioned earlier—OLPC,[54] or *Hole-in-the-Wall*—while initially popular, have come under increasing criticism. Some might say that the attraction of new mobile devices can lead to an over-dependence on the device, as happened with the above examples, with insufficient attention to improving learning. Local language content can be placed on a low-cost tablet, as was done with the *International Children's Digital Library (ICDL),*[55] to provide more reading (reading to learn) practice. Students can use SMS messages to talk about their lives, share school assignments or to get advice from teachers or volunteer facilitators about math or reading questions (as used in *Dr. Math*[56] or *Bangladesh Virtual Interactive Classrooms (BVIC)*,[57] respectively). *Worldreader*[58] takes advantage of the provision of content for those who lack sufficient content in relevant languages in feature phones that have the greatest penetration in LMICs. These are just a few examples of how the devices themselves constitute a prominent component of implementation, in the present era of incredibly rapid change, are very attractive to developers and the public in the broad domain of international development.

b. *End-users.* Designs may fail when they are found to be incompatible with particular population characteristics. Conversely, they may succeed especially because they are designed with a

[53] M. Kam (personal communication, 2013) has rightly pointed out that "in any hardware innovation, there is almost inevitably some innovation (or development) on a software component that goes hand-in-hand with the hardware in order to make the hardware meet its intended goals." This caveat should be kept in mind for M4R devices as well.
[54] See Annex B, project summary 24.
[55] See Annex B, project summary 17.
[56] See Annex B, project Summary 13.
[57] See Annex B, project summary 5.
[58] See Annex B, project summary 43.

particular population in mind.[59] Among the projects reviewed here, several have focused on female participation. For example, *Bunyad Mobile-Based Post-Literacy Program* in Pakistan[60] and *PAJEF Literacy Classes* in Senegal[61] are explicit about the centrality of women, though little is provided as to how gender has influenced the design of the program itself. More can certainly be done to tailor design devices for girls and women rather than simply distributing them.[62] By contrast, specific ethno-linguistic groups have been targeted by interventions that provide reading content in locally appropriate languages, such as the projects *1001 Stories,*[63] *Shellbooks Localization Systems*,[64] *PAJE Nièta (Support to Youth Entrepreneurs Project)*,[65] and the *Yoza Project*.[66] Other projects, such as *MILLEE,*[67], *SenMobil –Kindergarten Mobile Learning*,[68] and *Total Reading Approach for Children (TRAC) project*,[69, 70] have utilized mobile gaming-style apps to appeal to young children,

c. *Context*. It is somewhat surprising that most projects provided relatively few details on the take-up (in empirical terms) of the intervention within their particular cultural contexts. That is, if mobile phones are distributed to individuals for use in the home, outside of class hours, in contrast to the use of such phones in a completely flexible manner, would specific contexts lead to different results? Information about the social ecology of an intervention is rarely provided. One counter-example is the *Bridges to the Future Initiative (BFI) – South Africa*,[71] where a multi-linguistic platform was deployed for specific cultural groups. In addition, only one[72] of the

[59] Two of the projects mentioned in the above section—*OLPC* and *Hole in the Wall*—were targeted because of their noticeable specifications for use by young children. Among other things, *OLPC* used brightly-colored laptops to appeal to young children, while *Hole in the Wall* created kiosks that comfortably accommodate a child's stature. Nonetheless, these efforts to cater to the end user were insufficient, as other aspects of each project had limitations related to the children targeted (e.g., in *OLPC*, limited professional development for teachers at relatively high cost, and, in *Hole in the Wall* there is limited content in local languages and poor integration with schools).

[60] See Annex B, project summary 11.

[61] See Annex B, project summary 27.

[62] See Kumar et al. (2010) for a discussion of gender and mobiles in rural India, under conditions of "unsupervised" use.

[63] See Annex B, project summary 1.

[64] See Annex B, project summary 35.

[65] See Annex B, project summary 26.

[66] See Annex B, project summary 44.

[67] See Annex B, project summary 20.

[68] See Annex B, project summary 34.

[69] See Annex B, project summary 40.

[70] Shuler (2012) reviewed the apps on iTunes, and found that they were nearly all focused on populations in the United States. About 80 percent of apps in education target children, perhaps not too surprising considering parents typically buy apps to help their children learn. Of these educational apps, toddlers are by far the most popular targeted user of the apps, capturing 58 percent of the market. Somewhat more surprising is that reading acquisition is rather poorly represented when compared with STEM (science, technology, math) subjects. Also, although only 20 percent of the educational apps target primary school children, nearly 50 percent of the top selling apps are made for these children. In comparison, middle and high school age groups lag far behind in app availability and sales. The consumer base of educational apps is an ever growing one that has yet to reach its full potential. The dramatic increase in smartphones and tablets has provided a supplementary learning device approach, and no doubt many new apps will be forthcoming soon.

[71] See Annex B, project summary 2.

[72] See Annex B, project summary 7.

projects in this review explicitly sought to produce designs that assist learners who have mental or physical disabilities.[73]

d. *Design solutions*. One general implication drawn from this landscape review is that it is possible to study the intersection of purposes along with devices and end users—what is characterized here as a *design solution*. Each project that was reviewed here constitutes a *design solution* that comprises the above parameters (at a minimum). Even so, it is not obvious from the programmatic and research reports available that the design solution is fully understood by the implementation teams *before* the project is put into place. In numerous instances, one or two parameters (e.g., the targeted end user and/or the technical parameters of the device employed), are left poorly specified.

When creating appropriate *design solutions* – whether started as "device-based" approaches or focused on a specific set of end users – projects face all the usual problems of any engineering strategy.[74] Educational specialists in the M4R domain must deal with the multiple problems that arise when dealing with different devices to teach different skills to different people at different ages in different contexts.

6. Analysis and implications of the current M4R landscape

a. *Who are primary users of M4R?* The spectrum of end users in the 44 projects reviewed is quite broad and ranges from children to out-of-school youth to teachers (**Figure 8**). The majority of projects focus on children and youth, which is not surprising given that the most common purpose described above is that of formal learning in schools. Adults and teachers also comprise a large segment of the M4R landscape.

   Gender is a key area in reaching the MDGs, however, only four projects (a little under 10 percent) specifically listed women and girls as their primary end users. One of the reasons for this relatively small number is that a gender-focused strategy does not seem to be an M4R priority, other than for some women's groups (e.g., *Using Mobile Phones to Accelerate Literacy Education and Empower Afghan Women*[75]) as a locus of activity, as is frequently done in non-formal education (NFE) programs. Similarly, when analyzing projects a focus on learners with disabilities, though many projects in the United States work with this beneficiary group, the present review found only one project[76] with this specific interest.

[73] There is a growing interest in the use of ICTs for inclusive education (see http://www.g3ict.org). In the present M4R review, it seems possible to convert some known technologies to work for inclusion of the handicapped and disabled, and this is likely to happen further in the coming years.

[74] There are other frameworks that focus on mobile learning, most notably the FRAME model of Koole (Koole, 2006; Koole, McQuilkin, & Ally, 2010), which shares the notion of convergence, but is less focused on design solutions. Also, Pachler, Bachmair and Cook (2010), provide a useful discussion of the cultural features that must be considered in effective designs.

[75] See Annex B, project summary 40.

[76] See Annex B, project summary 7.

In terms of *geographical* representation, nearly 60 percent (26 projects) had a focus on the sub-Saharan Africa region, with a wide spread of projects from South Asia to Latin America. About 50 percent of the projects had content and materials available in local language (see further discussion below).

Naturally, investment in M4R remains heavily influenced by donor community interest. The broad implication of having such diverse end users is that appropriate design solutions will need to take into account a wide variety of individual skills and needs. Addressing such diversity is one of the main challenges facing M4R development.

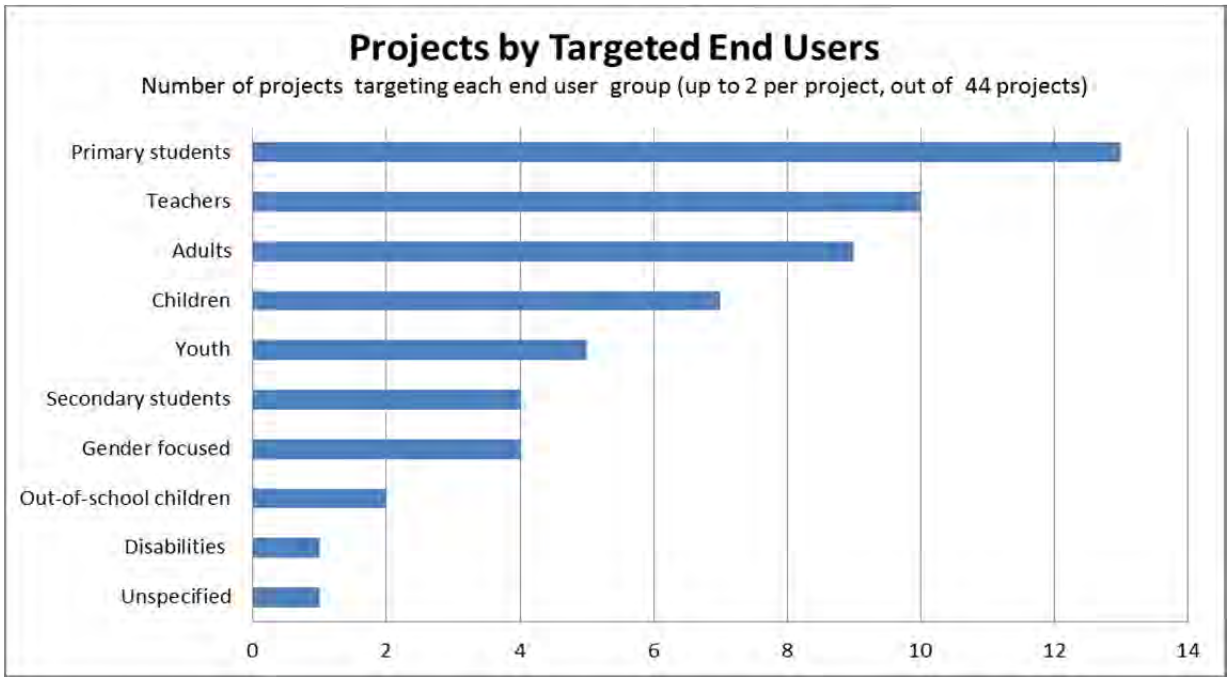

Figure 8. Projects by Targeted End Users

b. *Device types and connectivity*. The range of device types in the landscape reviewed is shown in **Figure 9**. Mobile phones (including simple mobile or cell phones; feature phones; and smartphones)[77] are used in nearly 75 percent (or 32) of the projects within the landscape space. Tablets are utilized in 25 percent (or 11) of the projects, and make up a relatively modest part of the current landscape, but as prices decline and content increases, it is likely that the number

[77] Definitions of mobile phones are imperfect and ever-changing. For the present review, simple *mobile* or cell phones are defined as the most basic type of device that is capability of cellular phone calls and SMS messaging. *Feature* phones are the 'upper end' of mobile phones, and may include multiple apps for diverse uses. A *smartphone* is typically a cellular device with telephone, text messaging, e-mail, Internet, Web browsing, as well as still and video cameras, MP3 player and video playback. With built-in functions, smartphones also run myriad free and paid applications. (See: http://www.pcmag.com/encyclopedia/term/51537/smartphone).

of projects devoted to tablets and smartphones will see dramatic growth in the coming years. The ubiquity of mobile phones is attractive, and some projects, such as *MILLEE,*[78] have been able to adapt the small phone screen for the development of basic reading practice games. With the steady decline of prices for SMS messages, voice calls, and Internet access, it is increasingly likely that devices will begin to provide online resources. Taking advantage of online capabilities will expand tremendously the range and variety of available learning materials, though from the present review, it is clear that the price-point of affordability has not yet been achieved in LMICs, without substantial subvention (e.g., *BBC Janala*[79]). One useful interim solution might be to use pre-loaded memory cards that can be inserted into many mobile devices, and that would also serve as inexpensive storage systems that could greatly expand the capability of mobile phones, without additional expense (as was done with *PAJE Nièta*[80]). As noted earlier, new devices themselves can stimulate innovation (as in the relatively recent creation of tablets). Still, older devices may be seen as adaptive responses to user needs and provider capabilities (such as radio, television, and computers) still play a prominent role in the landscape. Other devices noted include specialized platforms such as TeacherMate and WebBox, as well as MicroSD cards.

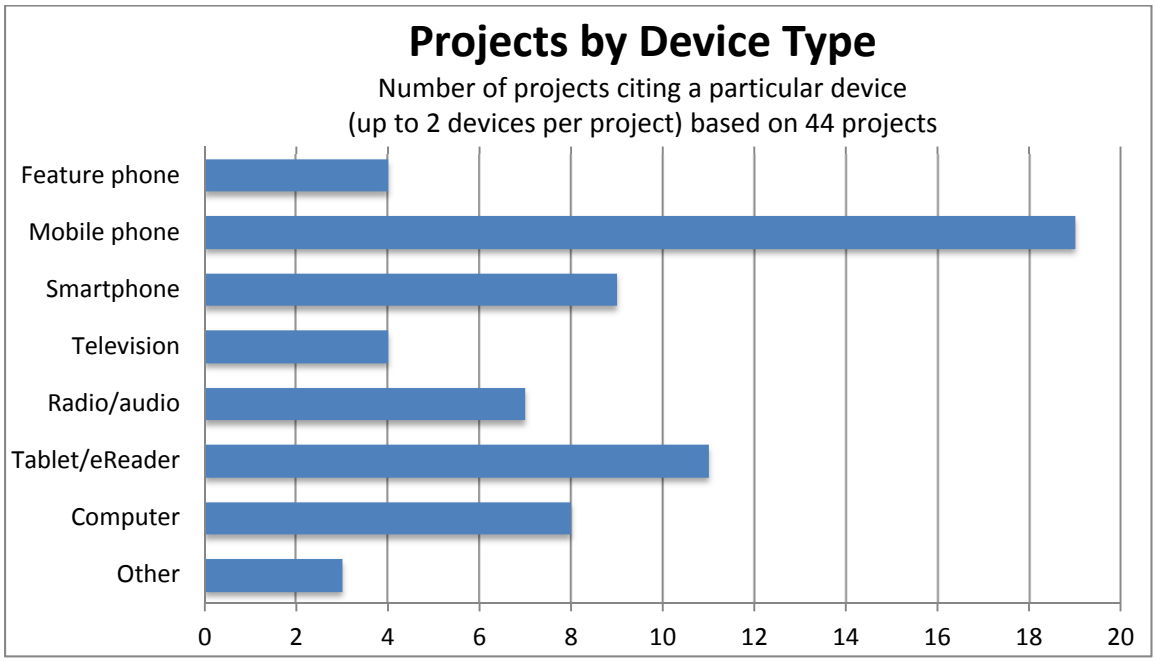

Figure 9. Projects by Device Type

c. *Purposes*. **Figure 6** (shown earlier) shows the landscape of purposes. The influence of donor funding for education (and most recently for early grade reading) is reflected in the observed emphasis on learning, especially in the formal education subsector. Clearly, there is a sense that

[78] See Annex B, project summary 20.
[79] See Annex B, project summary 6.
[80] See Annex B, project summary 26.

M4R solutions can reach more students and/or motivate them, as well as provide support for teachers. Similar results may also be seen in most OECD countries, with respect to investments in educational technology.[81] The growth of data collection seems to be due to at least two striking changes in development work. One is the advent of increased efforts to measure change and impact, as well as project accountability. Even simple feature phones make very efficient data collection and transmission devices (e.g., *Stanford Mobile Inquiry-Based Learning Environment [SMILE]*[82] and *Tangerine/TangerineClass (Beta version)*[83], not only dramatically reducing processing times, but also increasing the reliability of the data collected. The other is the potential for self-monitoring of learning that is inherent in devices that provide feedback to the learner (*Bridges to the Future Initiative [BFI] – South Africa*[84]).

Also worth mentioning is the importance of informal learning played an important role in more than 30 percent (15 projects) in the landscape. The growth in the use of mobiles in everyday life is clearly one way that developers can capture a larger portion of time for learning, but this will also require an in-depth understanding of the social ecology of learning contexts. In addition, informal learning offers the opportunity for collaborative work with peers (as in *M-Ubuntu*[85]). Intergenerational (child to parent) learning is possible, though not as yet evident in the projects reviewed. Overall, the implication from this review of purposes is that there are currently fewer purposes than there are end users and devices, and the combinations that lead to effective solution designs will likely remain quite varied over the coming years.

d. *Content.* The area of content has undergone a dramatic change in perspective over the past decade. Up until about 2000, most governments and donor organizations promoted the idea of a national language of instruction (LOI) that would overcome ethno-linguistic boundaries. However, with the arrival of EGRA and further sociolinguistic research, it has become clear that children in many LMICs simply have not learned how to read even when in school. This change in perspective has led directly to the promotion of local language (or mother tongue) reading programs in many countries that had previously been hesitant to embark on such localization (Wagner, 2011).

In M4R work, there has been a concomitant growth in attention to local language and localized textual resources (e.g., *International Children's Digital Library (ICDL)*[86] and *PlanetRead*[87]). Indeed, 22 projects (50 percent) reviewed made explicit reference to the use (or planned use) of local and indigenous languages (i.e., in other than official and international languages) in their project

[81] Cuban, 2003; Pedro, 2011.
[82] See Annex B, project summary 38.
[83] See Annex B, project summary 39.
[84] See Annex B, project summary 9.
[85] See Annex B, project summary 19.
[86] See Annex B, project summary 17.
[87] See Annex B, project summary 30.

design. In the *Bridges to the Future Initiative (BFI) – South Africa*,[88] for example, quadri-lingual content is developed locally by Molteno, a South African NGO, and is then produced as multimedia by a South African software company. These materials are then pilot-tested with children, and then given final review for compatibility with the national education authorities. Each of these levels of review is important, but each also takes time and funding.[89] Other projects, such as *Worldreader*,[90] take advantage of local language texts that already exist, and simply provide them on e-readers. The degree of effectiveness and compatibility with government curricula is often determined later. The use of local languages in one country may allow for programs to be reused in other countries where the languages overlap borders. Overall, the number of M4R projects that have focused on local languages is impressive, when compared to prior development of curricula in LMICs.

e. *Intellectual property rights and open educational resources.* In discussions of the international use of ICTs, a hot topic has been ownership of product development or *intellectual property rights* (IPR).[91] This perspective is especially accentuated in LMICs where the private sector (and development agencies) has occasionally been thought to be predatory in their practices. In this context, the present M4R landscape showed only a handful (about 16 percent) of projects that were explicitly 'open source' in their approach (e.g., *Open Learning Exchange (OLE) – TeacherMate*;[92] *Shellbook Localization Systems*[93]). In Shellbook, for example, the expectation is that materials will be gathered by community volunteers as culturally-specific resources in local languages. Nonetheless, about half of the M4R projects are explicitly proprietary with respect to IPR, and most of the remainder made no reference to ownership.

In sum, despite seemingly strong public support for the development of free and open educational resources, most of the current projects have not yet adopted that notion. This might be because, in the infancy of any field, developers are not as willing to share as they try out new systems. For example, one of the best-known open resource projects is MIT's posting of many of its course offerings on the Internet. These are contributions of educational resources that have been developed over many decades, and thus they perhaps need less protection by the owners.[94]

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[88] See Annex B, project summary 9.

[89] There may be important trade offs in design solutions in the content area. Satisfying local requirements (e.g., local languages) is more costly than the mono-lingual programs that use international languages. This has been true for decades in the textbook (non-ICT) publication arena. How to balance local designs with expense will surely be an issue to address in the coming years. Thanks to M. Kam for his comments on this topic.

[90] See Annex B, project summary 43.

[91] See OECD (2011).

[92] See Annex B, project summary 25.

[93] See Annex B, project summary 35.

[94] The advent of MOOCs (Massive Online Open Courseware) is another case in point. While there are many claims on the 'openness' of these educational resources, the major consortia that support MOOCs have indicated they will need to sell them in order to be sustainable. The impact on LMICs is a matter of growing concern as well: see the outcomes of a recent international conference at the University of Pennsylvania on this topic (see http://www.moocs4d.org).

f. *Costs and 'total cost of ownership.'* Given the perception that ICTs are expensive – and perhaps too expensive for low-income countries – surprisingly little information is provided publicly on the actual costs of devices, software and human resources for implementation of projects. It appears that most projects are funded by donor or private sector support, and do as much as they can in the time available. This is clearly a supply-side approach, which may be appropriate in the initial development stage. Even the few projects that are integrated into a national curriculum seem to exist only because a donor agency has provided support to the ministry to undertake the project.

   In terms of what has been called the 'total cost of ownership' (TCO), it is clear that there are costs beyond that of the mobile device deployed. For example, in the *Yoza Project* in South Africa,[95] students use mobile phones with a free app, but the cost of the social networking and texting is not free. It is unclear as yet whether the additional costs of using this social networking have a learning impact that is greater than the cost of the usage. This cost comparison is similar to that of the TCO, where training and maintenance need to be added to the price of, say, the hardware device.[96, 97] In the *Worldreader* project,[98] one notable impediment was that about 40 percent of devices broke during use and needed to be replaced during the one school year trial study. Overall, cost is a significant barrier that currently can be met at present only by external assistance.

g. *Partnerships and organizations*. More than half of the landscape projects listed partnerships with other agencies and organizations. In many of these cases, it was difficult to determine the extent of the partnership. In some cases, the implementing agency listed the donor agency without specifying whether the contribution was simply funding, or whether technical support was also provided. Similarly, universities are mentioned in eight projects (about 18 percent), but it is unclear what their contribution might be. Interestingly, about 10 percent of the projects are supported and run completely by local NGOs. Among the major private sector companies involved in the M4R area are: Amazon, Microsoft, Nokia, Orange, Pearson, Qualcomm, and Vodafone. Among the aid and intergovernmental agencies most involved with M4R are: ADB, AFD, DFID, IDB, UNDP, UNESCO, UNICEF, USAID, and the World Bank.

[95] See Annex B, project summary 44.

[96] For a discussion of TCO in developing countries, see Moretti; for a similar discussion of the "total burden of assessments" in LMICs, see Wagner et al. (2011).

[97] It has also been suggested that costs can be reduced through a Bring Your Own Device (BYOD) approach, where learners can use their own mobile devices, with content loaded from a M4R project implementer. This approach could potentially reduce costs, but also adds variability in devices and software such that any gains might be subject to losses as well. Thanks to M. Kam for raising this issue.

[98] See Annex B, project summary 43.

h. *Supply and demand*. The notion of supply and demand in education has been around for many years.[99] One key aspect of relevance to M4R is the conundrum exemplified by the phrase '*if you build it, they will come*.'[100] In other words, will the users find a design solution attractive, effective and affordable enough to continue usage after the glow of attention has subsided? For the most part, the interventions described herein are pilot projects that are rarely tested for the demand side of the equation. For example, *PlanetRead*[101] has been working in India for more than a dozen years, and has only recently begun to scale up nationally, showing that it can take years to build public demand. The reality is that many donor agencies and governments seem more concerned about the immediate supply than with longer-term demand. A better balance needs to be achieved.

i. *Evidence and M&E*. Many of the projects (and especially their websites) promote such outcomes as 'children reached' or 'positive reactions of stakeholders and government officials,' with little attention to learning outcomes. Unfortunately, many M4R projects do not have adequate metrics or monitoring and evaluation tools. Priority should be given to developing metrics in the M4R domain, akin to the work done more broadly in ICT for development (Wagner, 2005). As with sectors in development work, M4R work needs empirical evidence in order to justify further investments. In the health sector, for example, ICT-based interventions to some degree share the idea that a specific intervention, with adequate metrics, can measure the consequences, as in RCT studies.[102] The only M4R project reviewed here that contained an adequate RCT design was *Project ABC* in Niger.[103, 104] Pending availability of funding, this type of impact evaluation approach will likely increase in the coming years.[105]

j. *Sustainability, replication, scalability*. Many interventions fail at the point of implementation into a specific cultural context, often after the initial sense of excitement expressed by stakeholders wanes. An assessment of whether ICTs are better in a given context than a non-technological approach requires critical consideration *prior* to investment in implementation. Further, the

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[99] See, for example, the global work of OECD in Schleicher (2012).
[100] Adapted from the line in the movie, *Field of Dreams*.
[101] See Annex B, project summary 30.
[102] M. Kam (personal communication, 2013) has rightly suggested that "usage metrics are much more helpful than input-based metrics…([measuring] such things as server-based logs, keystroke data logging, etc. This is mainstream practice in the Human-Computer Interaction (HCI) community, and should become part of standard methodology in the ICT in Education projects."
[103] See Annex B, project 2.
[104] In Project ABC, Aker et al. (2011) found that the use of mobile phone-based instruction on reading had a significant positive impact on illiterate adults. One of the limitations of the reported findings is that little information is provided on the nature of the intervention itself. While RCT designs are important, they only make sense when there are credible measures of learning outcomes that can satisfy the education community. In other words, if there is no clear theoretical model for a particular design solution, then testing it with a RCT experiment is of little predictive value for use in other contexts.
[105] An impressive current example of RCTs in M4R is the project undertaken by RTI in the Kenya PRIMR ICT Intervention Evaluation. RTI plans to assess the effectiveness of several interventions including: the roles of ICT-equipped tutors in the classroom; teachers who have assistive multimedia teaching material; and students with personal e-readers devices loaded with grade-appropriate eBooks for use at home and in the classroom (Piper, Mugenda & Kwayumba, 2013).

ability of an intervention to diffuse[106] and go to greater scale—as is promised in many M4R design solutions—most often does not transpire. Either external funding is fully expended, or the project itself was ineffective or, most often it seems, both. One project with potential is the well-funded effort of *BBC Janala*,[107] which has significant multi-year funding from the British government. Still, research to understand the relevant factors to overcome these barriers is high on the list of challenges for all projects. Scalability seems achievable only if an M4R program is adopted either by a government agency on a continuing basis, or by the end users themselves. None of the projects in the present landscape can as yet make this claim.

7. Conclusion: looking ahead

The contemporary use of technology for improving education has been around for decades. Nonetheless, the relatively recent advent of *mobile* technologies that have tremendous reach into all populations—young and old, urban and rural, rich and poor—across the globe provides a new opportunity to *reimagine* traditional forms of educational design and delivery. The potential of these changes has been explored in this review through an investigation into the design solutions represented in a substantial group of projects in numerous low and middle income countries.

Substantial opportunities will arise from the use of new, more powerful M4R innovations. Already, numerous creative and expanding interventions are taking place. Some of these focus on increasing inclusion of diverse populations, others focus on creating content that provides better opportunities of scaling up, while still others expand beyond the confines of reading development to include broader sets of skills and empowerment that will drive greater motivation to learn. As noted in the previous section, there are also serious challenges. Among these are: the lack of solid evidence of effectiveness, a continued dependence on external funding, and overuse of supply-side approaches to design solutions.

It is obvious that the world of technology, particularly mobile technology, is changing rapidly. Nonetheless, a number of trends are becoming apparent. These developments suggest several scenarios for the future:

- At the *micro-level*, there will be inexpensive, intuitive and real-time assessment tools available to identify each child's reading development, with information provided for teachers and parents alike, so that everyone knows if learning is actually happening, and in which domains. And, we will have teachers who are trained to teach reading effectively using mobiles. Children's progress and school monitoring would provide the kind of data transparency that community-based organizations can use to push for a higher quality of education delivery and improved reading outcomes for all children. M4R tools are beginning to be available to allow for this now, however significant investment is needed to train teachers and community members to take advantage of them.

[106] According to Rogers (1995) diffusion is "the process by which an *innovation* is communicated through certain *channels* over *time* among the members of a *social system*."
[107] See Annex B, project summary 6.

- At the *macro-level*, local and national authorities will have monitoring tools that will reveal inequities within classrooms, across schools and across regions. Identification of disparities is crucial for addressing the needs of the most marginalized groups. Just as importantly, these data could be posted online so that the communities and parents could better understand learning outcomes for their children. Again, aspects of these changes are already happening in various projects around the world.[108]

- *Mother tongue and multilingual instruction* for all children (with appropriate research-based transitions to second language literacy) is essential, and mobiles offer an exceptional way forward. Mobiles can be loaded with multiple languages, can connect the visible with the aural (essential for learning to read), and can make the transition from formal school learning into the informal arena. Clearly, there is a huge technological advantage when adequate design solutions can be found and adapted to diverse end users. The pieces are just starting to come together, and once further refined, the opportunities could be immensely valuable.

- *Intergenerational and community reading*. Literacy specialists have known for decades that the best predictor of children's reading acquisition is parental literacy (Wagner, 2010). As M4R devices evolve, are used by both children and parents, and become more interconnected, there will be increased opportunity to capitalize on parent-child interaction, as well as with siblings, peers, and community literacy activities. Even when parents and community members are low-literate or illiterate themselves, interaction around reading and printed materials is possible and desirable. The creation of a community of readers is what educators worldwide have sought for decades, and will become one of the great benefits of M4R initiatives.

Final thoughts

Many claims have been made about the impact of ICTs in general, and mobiles in particular, on reading and learning, but relatively few have received adequate research attention. This is of particular concern due to the significant attention and growing investments currently being made in the area. Research is needed both on types of mobile platforms (cell phones, smartphones, tablets, etc.) as well as on the kinds of design solutions appropriate for diverse groups of children from low income backgrounds. At the same time, there is a great need for measureable, sustainable and scalable design solutions that address policy priorities. In addition, there is a major need to include, in the overall budget of M4R projects, sufficient evaluation resources so that adequate evidence about such investments can be obtained and built upon.[109] Overall, there is little doubt that M4R work will continue to grow, along with mobile ubiquity and mobile learning around the world.

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[108] For an example of an "Education Report Card" activity in Latin America and the Caribbean, see the Partnership for Educational Revitalization in the Americas (PREAL): http://www.preal.org/ENGL/ActividadesN.asp?Id_Quienes=&Id_Seccion=2

[109] See Wagner (2005) for an analysis of the level of funding for evaluation (roughly 10 percent of total investments) that should be put into M4R and similar ICT4D projects.

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ANNEX A: SYNOPSIS CHART OF REVIEWED PROJECTS

Legend for Purposes: Formal learning and instruction (FLI); Informal learning (IL); Training (TR); Content (Cont); Data collection (Data); and Communication and Dissemination (Comm).

	Project Name	Country or Region	Owners, Partners & Implementing Organization(s)	Mobile Device Type	Project Intervention Purposes	Target Group
1	1001 Stories	Uganda, India	Seeds of Empowerment	Smartphone; eReader	IL; Cont	Children
2	Project ABC	Niger	Catholic Relief Services/Niger, Tufts University, University of Oxford, Système d'Information sur les Marchés Agricoles	Mobile phone	FLI; Cont	Adults
3	Across Radio	South Sudan	Pioneers Overseas Aid and Relief Fund, Danish Church Aid, All Children Reading: A Grand Challenge for Development	Radio/audio	TR	Teachers; Out-of-school children
4	AlfabeTIC	Argentina	Institute of International Education Planning (IIEP)/Argentina, Sancor Foundation, OEI, and state-funded community literacy centers	Smartphone; Computer	FLI; Cont	Youth; Adults
5	Bangladesh Virtual Interactive Classrooms (BVIC)	Bangladesh	Örebro University (Sweden), Bangladesh Open University, Swedish Program for ICT in Developing Regions (Spider) at Stockholm University	Television; Mobile phone	FLI; IL	Youth
6	BBC Janala	Bangladesh	BBC, UK Department for International Development (DFID)	Mobile phone; Computer	IL; Cont	Adults
7	Bookshare International	Global	Benetech	Tablet; Smartphone	IL; Cont	People with reading disabilities
8	BridgeIT	Chile, Colombia, Haiti, India, Indonesia, Nigeria, the Philippines, South Africa, Tanzania	Pearson Foundation and Nokia, International Youth Foundation (IYF), United Nations Development Program (UNDP), USAID	Mobile phone; Television	FLI	Primary students
9	Bridges to the Future Initiative (BFI) – South Africa	South Africa	Molteno Institute of Language and Literacy and the International Literacy Institute of the University of Pennsylvania, All Children Reading: A Grand Challenge for Development	Tablet; computer	FLI	Primary students
10	Broad Class: Listen to Learn	Pakistan	The Communicators (Pvt.) Limited	Radio; Mobile phone	FLI; IL	Teachers and children
11	Bunyad Mobile-Based Post-Literacy Program	Pakistan	Bunyad Literacy Community Council, UNESCO, Mobilink Pakistan, Nokia Pakistan	Mobile phone	FLI; TR	Rural women
12	Digital Education as a Tool of Progress: Electronic Books Pilot Project	Chile	Center for Innovation in Education, Chile Foundation, Fund for Competitive Innovation of the Libertador General Bernardo O'Higgins regional government, Regional Secretary of Education	Tablet/eReader	FLI; Cont	Primary students

	Project Name	Country or Region	Owners, Partners & Implementing Organization(s)	Mobile Device Type	Project Intervention Purposes	Target Group
13	Dr. Math	South Africa	Meraka Institute, South Africa Council for Scientific and Industrial Research	Mobile phone, Computer	FLI	Primary and secondary students
14	eEGRA	Mali, Tajikistan, Kyrgyzstan, Philippines	Education Development Center (EDC), USAID	Computer; Tablet	Data	Teachers
15	FunDza	South Africa	FunDza Literacy Trust	Mobile phone; Computer	IL; Comm	Youth
16	Interactive Radio Instruction (IRI) and Interactive Audio Instruction (IAI)	Global	Education Development Center (EDC), USAID, World Bank, the Inter-American Development Bank (IDB), Organization of Ibero-American States, RTI International, FHI 360, Save the Children	Radio/audio	FLI; TR	Diverse learners
17	International Children's Digital Library (ICDL)	Global	University of Maryland, Internet Archive	Smartphone, Tablet	IL; Cont	Children
18	Jokko Initiative	Senegal	UNICEF, Tostan	Mobile phone	FLI; Comm	Adults, women
19	M-Ubuntu	South Africa	M-Ubuntu, MacArthur Foundation, Sprint, Learning Academy Worldwide, University of Michigan, di Gameworks, Umlambo Foundation, University of Durban, Volunteers in Technology and Literacy	Mobile phone	IL; Comm	Teachers; Primary students
20	Mobile and Immersive Learning for Literacy in Emerging Economies (MILLEE)	India (other related projects in Sub-Saharan Africa, China)	Carnegie Mellon University's Human-Computer Interaction Institute, US National Science Foundation, local partnering NGOs	Mobile phone	FLI; Cont	Children
21	MobiLiteracy Uganda	Uganda	Urban Planet Mobile, All Children Reading: A Grand Challenge for Development	Mobile phone	FLI; TR	Adult caregivers
22	MoMaths	South Africa	Nokia, South African government (Meraka Institute, Dept. of Basic Education, Dept of Science and Technology, Dept. of Communications, Presidency)	Mobile phone; Computer	FLI; Comm	Secondary students
23	Nokia Life Plus	China, India, Indonesia, Nigeria	Nokia, Reuters Market Light (India), Ministry of Agriculture (Indonesia), Beijing Nongxintong Technology (China), Zain/Airtel, Glo Mobile (Nigeria)	Mobile phone	IL; Cont	Adults; Youth
24	One Laptop per Child (OLPC) – Ethiopia	Ethiopia	One Laptop per Child (OLPC), Engineering Capacity Building Program, GTZ, Eduvision	Tablet/eReader	IL; Cont	Primary students
25	Open Learning Exchange (OLE) – TeacherMate	Rwanda, Ghana	Open Learning Exchange (OLE), Innovations for Learning	TeacherMate device; Computer	FLI; Data	Primary students
26	PAJE Nièta (Support to Youth Entrepreneurs Project)	Mali	Education Development Center (EDC), USAID	Smartphone/ MicroSD card	FLI; Cont	Out-of-school children

	Project Name	Country or Region	Owners, Partners & Implementing Organization(s)	Mobile Device Type	Project Intervention Purposes	Target Group
27	PAJEF Literacy Classes	Senegal	UNESCO, Proctor & Gamble, Sankoré program (joint partnership between the Public Interest Group for Digital Education in Africa (GIP ENA), the French Ministry of Foreign Affairs, and UNESCO Dakar)	Mobile phone	FLI; TR	Women and girls
28	PHARE Program (Programme Harmonisé d'Appui au Renforcement de l'Education)	Mali	Education Development Center (EDC), USAID	Radio/audio; Mobile phone	TR; Data	Primary teachers
29	PIEQ (Package for Improving Education Quality)	Democratic Republic of Congo (DRC)	Education Development Center (EDC), Catholic Relief Services, DRC's National Ministry of Education, New Generation Media Initiatives for Africa, RTI International, USAID	Radio/audio	FLI; TR	Teachers
30	PlanetRead	India	PlanetRead, Brij Kothari (Indian Institute of Management, Ahmedabad [IIMA]), Birla Institute of Management Technology (Funders: Ministry of Human Resource Development, Indian Space Research Organization; All Children Reading: A Grand Challenge for Development)	Television	IL; Cont	Adults
31	Pratham – Learn, Out of the Box	India	Pratham Education Foundation, Vodafone Foundation India	Webbox; Television	FLI; TR	Primary students
32	Radiophone Project	India	Sesame Workshop India, Qualcomm Inc., Schwab Charitable Fund, HSBC	Radio; Mobile phone	Cont	Children
33	Real-time Access and Utilization of Children's Learning Data	Ghana, Haiti	The Earth Institute at Columbia University, Modi Research Group, Millennium Villages, MDG Centre	Mobile phone	FLI; Data	Primary and secondary students
34	SenMobil –Kindergarten Mobile Learning	Senegal	SenMobile	Smartphone; Feature phone	FLI; Cont	Children; Teachers
35	Shellbook Localization Systems	Burundi, East Africa	Life Access Technology Trust, World Vision.	Computer	Cont; TR	Adults; Children
36	Sistema Uno	Mexico, Argentina, Brazil, Colombia, Ecuador, El Salvador, Guatemala and Honduras	Grupo Santillana, UNESCO, Cambridge ESOL, Apple, Discovery Education, Animal Planet	Tablet	FLI; Cont	Preschool and primary students
37	Somalia Interactive Radio Instruction Project (SIRIP)	Somalia (South Central Zone, Somaliland and Puntland)	Education Development Center (EDC)	Radio/audio	FLI; Cont	Children; Teachers

	Project Name	Country or Region	Owners, Partners & Implementing Organization(s)	Mobile Device Type	Project Intervention Purposes	Target Group
38	Stanford Mobile Inquiry-Based Learning Environment (SMILE)	USA, India, Argentina	Seeds of Empowerment, Stanford Graduate School of Education, Programmable Open Mobile Internet	Mobile phone; Computer	IL; Data	Primary students
39	Tangerine/Tangerine Class (Beta version)	Global; as of June 2013, Tangerine had been deployed in 20 different countries	RTI International	Smartphone; Tablet	TR; Data	Primary teachers
40	Total Reading Approach for Children (TRAC)	Cambodia	World Education, Inc., Kampuchean Action for Primary Education, Cambodia Ministry of Education, Youth and Sport, with support from All Children Reading: A Grand Challenge for Development	Smartphone; Tablet	FLI; Cont	Primary students; Teachers
41	Using Mobile Phones to Accelerate Literacy Education and Empower Afghan Women	Afghanistan	Afghan Institute of Learning (AIL) in collaboration with Georgetown University, Creating Hope International and with support from the U.S. Department of State, UNESCO, United Nations Literacy Decade Fund.	Feature phone	IL, Comm	Women and girls
42	Ustad Mobile Literacy	Afghanistan	Paiwastoon, U.S. Department of State, USAID, Afghanistan Ministry of Education	Feature phone	FLI; IL	Adults
43	Worldreader	Ghana, Kenya, Malawi, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe	Worldreader, UNESCO, Amazon, Random House, biNu, All Children Reading: A Grand Challenge for Development	Tablet/Kindle; Feature phone	Cont, Data	Primary and secondary students
44	Yoza Project (formerly m4Lit)	South Africa	Fontera, Clockwork Zoo, Shuttleworth Foundation, Praekelt Foundation	Mobile phone	IL, Cont	Children

ANNEX B: PROJECT SUMMARIES[110]

1. 1001 Stories

1. **Country/Region(s):** Uganda, India
2. **Project owner/partner(s):** Seeds of Empowerment
3. **Main purpose of the project:** Support student-centered learning by empowering children to create their own original digital stories and promote content through publishing and selling selected stories in downloadable digital formats
4. **Technology**
    a. **Device(s):** Smartphone, e-reader
    b. **Infrastructure/platform:** Electricity, Internet connectivity, Android-based application that turns written text into a multimedia story with pictures and voiceovers
5. **Project sample/diversity:** Unknown
6. **Background/Focal area(s) of intervention:** 1001 Stories promotes "literacy for children and youth living in poverty-stricken areas by mobilizing them to become empowered and original storytellers" (Seeds of Empowerment [SOE], 2012). Volunteers conduct storytelling workshops that teach children how to use the mobile learning device application, and then Seeds of Empowerment collects the stories. The best work is published internationally and sold in downloadable digital formats via mobile application stories like the Apple app store or Amazon Kindle eBook store. "The proceeds of these mobile application sales return to the storytellers, their families, and communities to promote entrepreneurship and support the local education system" (SOE, 2012).
7. **Gender/Disability focus:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Stories are naturally adapted to the local context as individuals create content based on their own experiences and in their own language; topics vary based on the interests of the author
    b. **Content production:** Content is primarily generated by children participating in the project with the support of technical staff for digitization and publication
    c. **Ownership:** Proprietary
9. **Evaluation:** None
10. **Project current status:** Ongoing
11. **Other/Additional information:** None

[110] The information in Annex B has been collated from sources listed under each project. The perspectives and analyses contained herein are dependent on these sources, and do not necessarily reflect the views of USAID.

12. Sources:

Project website: http://seedsofempowerment.org/what-we-do/1001-stories.html

Seeds of Empowerment. (SOE). (2012). *1001 Stories*. Retrieved from http://seedsofempowerment.org/projects/1001-stories-2/

Muñoz-Reyes, C. (2013). *SMILE: Towards a New Pedagogical and Paradigm Shift* [PDF document]. Retrieved from http://www.oas.org/en/scholarships/virtualeduca/PP/SMILE.pdf

2. Project Alphabétisation de Base par Cellulaire (ABC)

1. **Country/Region(s):** Niger
2. **Project owner/partner(s):** Collaborative initiative between Catholic Relief Services/Niger (CRS/Niger), Tufts University, the University of Oxford, and Système d'Information sur les Marchés Agricoles (SIMA)
3. **Main purpose of the project:** Supplement adult literacy instruction via voice and SMS through a mobile phone-based literacy and numeracy program in Niger
4. **Technology**
    a. **Device(s):** Mobile phone
    b. **Infrastructure/platform:** SMS-based cell coverage, electricity and/or rechargeable batteries
5. **Project sample/diversity:** Project Alphabétisation de Base par Cellulaire (ABC) served as a variant of a basic adult education intervention implemented by CRS/Niger. The CRS/Niger program provided eight months of literacy and numeracy instruction over a two-year period to approximately 6,700 adults across 134 villages in two rural and ethnically distinct regions in Niger. Of these villages, only 113 were eligible to participate in the intervention based on mobile phone coverage and although all students followed the same basic adult education curriculum, only half of the villages learned how to use a simple mobile phone. Applying the norms of the Ministry of Non-Formal Education, each village had two literacy classes (one for men and another for women), with a maximum of twenty-five students per class (Aker, Ksoll, & Lybbert, 2011).
6. **Background/Focal Area(s) of intervention:** ABC is a three-year, mobile phone-based pilot program to teach and practice literacy and numeracy in Niger. "[T]he program includes a mobile phone module as a complement to traditional literacy classes, thereby providing households with the opportunity to practice their literacy and numeracy skills via voice and SMS on their mobile phones. This addresses an important constraint to previous functional literacy programs in Niger, where it has been difficult for adult learners to practice what they have learned by accessing timely, up-to-date, and relevant information in their local languages" (Project ABC, 2010).
7. **Gender/Disability factors:** Project targets both men and women with the intention to measure differences between the two groups (Aker et al., 2011)
8. **Content**
    a. **Type of content/materials covered:** Basic literacy training materials are produced in English, French, Hausa, Zarma, and Kanuri (Aker et al., 2011)
    b. **Content production:** Unknown
    c. **Ownership:** Unknown

9. **Evaluation:** Internal research compared villages that implemented mobile phone training and utilized mobile phones in literacy courses (ABC villages) to villages that did not include mobile phones in the training (non-ABC villages). ABC Villages showed improved literacy test score compared to non-ABC villages. However, both groups showed substantial decreases in literacy test scores seven months after the training was completed, though ABC villages still showed slightly higher scores than non-ABC. Gains among the ABC villages' learners were attributed to increased motivation (teacher and student) and increased access to practice with SMS (Aker et al., 2011).
10. **Project current status:** The third year of Project ABC literacy courses were administered in January 2011; the website has not been updated since then though Aker (n.d.) noted potential future rollout in Mali and Ghana following the internal evaluation.
11. **Other/Additional information:** As of this writing, ABC is only used in Niger, though it has shown adaptability to other local languages and has potential for further growth.
12. **Sources:**

Project website: http://sites.tufts.edu/projectabc/

Evaluation website: http://www.aae.wisc.edu/mwiedc/papers/2011/Aker_Jenny.pdf
http://www.cgdev.org/content/publications/detail/1424423/

Aker, J.C., Ksoll, C., Lybbert T. (2012). Can Mobile Phones Improve Learning? Evidence from a Field Experiment in Niger. *Am. Econ.J.: Applied Economics*. 4(4): 94-120.

Aker, J.C. (n.d.). Project ABC: Using cell-phones as a platform for literacy and market information in Niger. Retrieved from
http://www.cgdev.org/doc/expert%20pages/Aker/Project_ABC_26feb09.pdf

Project ABC. (2010). *Project ABC: Mobiles 4 Literacy*. Retrieved from
http://sites.tufts.edu/projectabc/

3. Across Radio

1. **Country/Region(s):** South Sudan
2. **Project owner/partner(s):** Pioneers Overseas Aid and Relief Fund in partnership with Danish Church Aid, and All Children Reading: A Grand Challenge for Development
3. **Main purpose of the project:** Support professional development for teachers and literacy instructors; local language audio content serves as a literacy tutor to support primary school teachers and community groups
4. **Technology**
    a. **Device(s):** Solar powered digital audio players (*i.e.,* Megavoice, which is able to hold 160 hours of pre-recorded content and reportedly has a reach of up to 20 people per unit) (Across Sudan, n.d.)
    b. **Infrastructure/platform:** Audio recordings
5. **Project sample/diversity:** Target audience is primary school teachers and students in South Sudan, with a potential impact of 40,000 children (All Children Reading, 2011)
6. **Focal area(s) of intervention:** Using solar-powered digital audio players (DAPs), Across Radio has supported teachers in South Sudan by providing teaching resources and content in the local languages (Dinka and Bari). In an area where teachers have received limited or no training on literacy instruction, the DAPs serve as professional development tools for teachers and serve as instructional tools for literacy classes. In conjunction with a set of mobile books, recordings can function as a literacy tutor for children in school, or for out-of-school children who listen to the recordings in community group meetings.
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Pre-recorded literacy lessons
    b. **Content production:** Content is primarily generated by Across Radio project staff
    c. **Ownership:** Proprietary
9. **Evaluation:** None
10. **Project current status:** Ongoing
11. **Other/Additional information:** Across Radio also creates content focused on conflict resolution, peacebuilding, and hygiene, and has used DAP content with nomadic cattle herders (Pioneers Australia, 2012); the organization has also developed initiatives that focus on Christian content.

12. Sources:

Project website: http://www.across-sudan.org/index.php?option=com_content&view=category&id=14&Itemid=14

Across Sudan. (n.d.). *Presenting powerful media.* Retrieved from http://across-sudan.org/index.php?option=com_content&view=category&id=14:presenting-powerful-media&Itemid=14

All Children Reading. (2011). *Teaching children to read using low-cost digital audio layers as instructional tools for both children and teachers, South Sudan*. Retrieved from http://allchildrenreading.org/teaching-children-read-using-low-cost-digital-audio-players-instructional-tools-both-children-and-te

Pioneers Australia. (2012). *South Sudan: Across radio*. Retrieved from http://www.pioneers.org.au/Projects/OARF/ACROSS-Radio-SOUTH-SUDAN.aspx

4. AlfabeTIC

1. **Country/Region(s):** Argentina
2. **Project owner/partner(s):** Institute of International Education Planning (IIEP)/Argentina, in partnership with the Sancor Foundation, Organización de Estados Iberoamericanos (OEI), and state-funded community literacy centers
3. **Main purpose of the project:** Extend and enrich existing youth and adult literacy programs by providing content for learners to practice literacy skills through guided modules and exercises/games while promoting the integration of partner community organizations
4. **Technology**
    a. **Device(s):** Smartphone, computer
    b. **Infrastructure/platform:** Internet access, electricity and/or batteries
5. **Project sample/diversity:** No exact number of intended end-users noted, but 70 literacy tutors have been trained to date in one department of Argentina (Schurmann, 2013); materials are only available in Spanish.
6. **Focal area(s) of intervention:** AlfabeTIC is an initiative that complements the initial literacy processes of youth and adults by generating interactive multimedia material for appropriate literacy acquisition, available through multiple access channels, but principally through mobile devices (Schurmann, 2013). The content consists of ten modules on different topics, each module consisting of a video introduction to the theme and complementary interactive activities. Topics and situations relate to real youth and adult situations (*e.g.,* cooking, work, family, etc.). Additional applications include a karaoke game, an interactive map, related literacy games (*e.g.* word-picture matching) and an ATM emulator. Specialists from literacy teams work with community-based and volunteer literacy tutors at state-sponsored literacy centers to administer and oversee use of material.
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered**: Stories and modules specific to Argentine culture produced in Spanish with special emphasis on rural communities
    b. **Content production:** AlfabeTIC produces its own content
    c. **Ownership:** All content and gaming applications are available for free online through the project website
9. **Evaluation:** Initial assessment will be conducted in 2013 (Schurmann, 2013); data are only accessible via restricted website access at the time of this writing.
10. **Project current status:** Ongoing
11. **Other/Additional information:** Currently, materials can only be accessed with smartphones or phones with Internet capability and data connectivity.

12. Sources:

Project website: http://alfabetic.educativa.org/index.php

Schurmann, S. (2013). The Alfabetic project [PowerPoint Slides]. *Virtual Education Portal for the UNESCO Regional Consultation Workshop for the Americas*. Washington, DC.

Organización de Estados Iberoamericanos. *Recursos en Internet- Educación Alfabetización.* Retrieved from http://www.oei.es/oeivirt/recursos78.htm

5. Bangladesh Virtual Interactive Classrooms (BVIC)

1. **Country/Region(s):** Bangladesh
2. **Project owner/partner(s):** Örebro University (Sweden) and Bangladesh Open University, with support from the Swedish Program for ICT in Developing Regions (Spider) at Stockholm University
3. **Main purpose of the project:** Enable rural students to attend classes and learn lessons on various subjects, including English language, through the provision of educational materials via SMS and seminars broadcast on television
4. **Technology**
    a. **Device(s):** Television, mobile phone
    b. **Infrastructure/platform:** Electricity, batteries
5. **Project sample/diversity:** Project focuses on reaching rural and disadvantaged populations (Alam & Islam, 2010)
6. **Background/Focal area(s) of intervention:** Bangladesh Virtual Interactive Classrooms (BVIC) is run by the Bangladesh Open University and is the largest long distance education project in Bangladesh (Grönlund & Islam, 2010). BVIC uses SMS to complement regular TV/video instruction. A learning management system (LMS) installed through mobile phones works to ensure an interactive, student-centered pedagogy (Grönlund & Islam, 2010). Using LMS, students interact with their teachers and peers, and can also self-assess, ask questions during classes, participate in the design of their own language learning experience while watching the video lessons, do homework with a learning partner, look up the meaning of difficult vocabulary words, etc. Teachers mainly prepare lessons for the class, and provide feedback by looking at the number of correct items for each student on the computer. Training is provided on integrating technologies with their instructional practices. The technology allows student activities to be tracked and monitored, allowing for more efficient student management (Andersson & Hatakka, 2010).
7. **Gender/Disability factors:** Unknown, though issues around disability/gender that can hamper students' school attendance are mentioned (Alam & Islam, 2010)
8. **Content**
    a. **Type of content/materials covered:** Created for Bangladeshi culture/context
    b. **Content production:** Content produced by local content developers
    c. **Ownership:** Open source
9. **Evaluation:** No evaluation available
10. **Project current status:** Unknown
11. **Other/Additional information:** While content/lessons are provided free of charge, text charges do apply

12. Sources:

Project website: http://www.spidercenter.org/newsroom/news/virtual-classroom-bangladesh

Alam, S., & Islam, Y. M. (2010). Virtual Interactive Classroom (VIC) using mobile technology at the Bangladesh Open University (BOU). Retrieved from http://wikieducator.org/images/4/45/PID_563.pdf

Andersson, A., & Hatakka, M. (2010). Increasing interactivity in distance education: Case studies Bangladesh and Sri Lanka. Information Technology for Development *16*(1), 16–33.

Grönlund, Å., & Islam, Y. M. (2010). A mobile e-learning environment for developing countries: The Bangladesh virtual interactive classroom. *Information Technology for Development* 16(4), 244–259.

6. BBC Janala

1. **Country/Region(s):** Bangladesh
2. **Project owner/partner(s):** BBC in partnership with the UK Department for International Development (DFID)
3. **Main purpose of the project:** Improve basic English language skills anywhere in the developing world through a multiplatform mobile innovation; BBC Janala is part of English in Action (EIA), an initiative of BBC World Service Trust (BBC WST) designed to raise the language skills of 25 million people in Bangladesh by 2017
4. **Technology**
    a. **Device(s):** Mobile phone, computer, television
    b. **Infrastructure/platform:** SMS messaging capabilities; Internet if using website
5. **Project sample/diversity:** BBC Janala services are aimed at adults aged 15-45 throughout Bangladesh. General results from the project website indicate that 1) Janala's target audience includes adults aged 15-45 years from a wide range of socio-economic backgrounds, 2) since its launch, the project's users have used over one million mobile lessons, 3) the first series of BBC Buaa reached five million viewers, while Bishshaash and BBC Janala Mojay Mojay reached 20.3 and 18.1 million learners respectively, and 4) 23.8 million Bangladeshi's (a quarter of the adult population) have accessed Janala to date (EIA, n.d.a).
6. **Background and focal area(s) of intervention:** BBC Janala was launched in 2009 with funding from DFID as part of EIA, a major initiative launched to raise the language skills of 25 million people in Bangladesh by 2017 (EIA, 2009). EIA is a nine-year program through which adult- and community-based interventions use mobile phones, local newspapers, television and the internet to provide platforms for English-language learning. EIA uses a combination of interactive audio and mobile technology and print and ICT-based materials to teach English listening and reading skills (EIA, n.d.b).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Audiovisual content was made available to teachers through micro SD cards on mobile phones; additional printed materials were also provided; Instruction was in English and Bangla
    b. **Content production:** Locally produced; involved foreign and local staff
    c. **Ownership:** Proprietary
9. **Evaluation:** According to the project website, a number of studies were conducted between May 2008 and March 2010 on the promotion of English language by EIA. However, it is not evident if impact studies examining learning using mobiles were conducted. The evaluations that are available investigated program effectiveness in relation to effective teaching practices and student performance. EIA also conducted various baseline studies to examine use of language and education levels of participating students. Walsh and Shaheen (2013) reported a further study that showed a potential increase in the use of English in teaching following EIA implemenation.
10. **Project current status:** Ongoing; the project aims to introduce a single core syllabus which will be achieved utilizing different media platforms and through establishment of English Language Clubs around the country
11. **Other/Additional information:** None

12. Sources:

English in Action project website: http://www.eiabd.com/eia/

BBC Janala project website: http://www.bbcjanala.com/

EIA. (2009). *BBC Baseline Study: BBC Janala Baseline Research Synthesis*. Retrieved from http://www.eiabd.com/eia/index.php/baseline-reports?download=23:bbc-eia-baseline-synthesis-report

EIA. (n.d.a). *BBC Janala enabling millions of Bangladeshis to learn English affordably*. Retrieved from http://www.eiabd.com/eia/index.php/bbc-janala-enabling-millions-of-bangladeshis-to-learn-english-affordably

EIA. (n.d.b). *Welcome to English in Action*. Retrieved from http://www.eiabd.com/eia_oldsite/

Walsh, C., & Shaheen, R. (2013). English in action (EIA): Mobile phones as an agent of change for large-scale teacher professional development and English language learning in Bangladesh. For American Educational Association Annual Meeting. San Francisco, CA. April 27 – May 1, 2013. http://oro.open.ac.uk/38405/1/English%20in%20Action%20(EIA)-%20Mobile%20Phones%20as%20an%20Agent%20of%20Change%20for%20Large-Scale%20Teacher%20Professional%20Development%20and%20English%20Language%20Learning%20in%20Bangladesh_Walsh.pdf

7. Bookshare International

1. **Country/Region(s):** Global
2. **Project owner/partner(s):** Benetech
3. **Main purpose of the project:** Provide access to reading materials for people with print disabilities[111]
4. **Technology**
    a. **Device(s):** Mobile phone, tablet, computer
    b. **Infrastructure/platform:** Internet, electricity/batteries
5. **Project sample/diversity:** People with reading or 'print' disabilities (*i.e.,* visual impairments, physical disabilities, and/or learning disabilities)
6. **Background/Focal area(s) of intervention:** Bookshare aims to increase the quantity and timely availability of books and newspapers in formats accessible to people with print disabilities, and to become the world's largest online library of accessible books. Bookshare members can find reading material on the Bookshare library and can download the book or newspaper onto the device that best suits them (*e.g.,* Braille reader, MP3 player, smartphone, digital tablet). Bookshare International was launched in 2008 and has grown to serve members in more than 45 countries, including many in the developing world (Benetech, 2014).
7. **Gender/Disability Factors:** Gender considerations unknown
8. **Content**
    a. **Type of content/materials covered:** Accessible versions of books, newspapers, magazines, and other publications available for digital download; content is delivered in a number of languages, including Afrikaans, Arabic, French, German, Hindi, Polish, Spanish and Tamil (Benetech, 2014)
    b. **Content production:** Content is adapted by Bookshare and global volunteers, in cooperation with the original content publishers (Benetech, 2014)
    c. **Ownership:** Proprietary
9. **Evaluation:** Unknown
10. **Project current status:** Ongoing
11. **Other/Additional information:** Bookshare membership requires payment of a one-time set-up fee and an annual subscription fee (Bookshare, 2014)

[111] Print disabled - A person who cannot effectively read print because of a visual, physical, perceptual, developmental, cognitive, or learning disability.

12. Sources:

Benetech. (2014). *Bookshare*. Retrieved from Benetech: http://benetech.org/our-programs/literacy/bookshare/

Bookshare. (2014). *International Membership*. Retrieved from Bookshare: https://www.bookshare.org/_/membership/international

8. BridgeIT

1. **Country/Region(s):** Chile, Colombia, Haiti, India, Indonesia, Nigeria, the Philippines, South Africa, Tanzania
2. **Project owner/partner(s):** Partnership between the Pearson Foundation and Nokia; previous partners include: International Youth Foundation (IYF), United Nations Development Program (UNDP), and USAID
3. **Main purpose of the project:** Enhance teacher and school system capacity through comprehensive professional development, working closely with local partners and organizations on the ground to provide instructional support to teachers for primary-grade learning through guided curriculum and visual multimedia content
4. **Technology**
    a. **Device(s):** Mobile phones, television
    b. **Infrastructure/platform:** Electricity, cellular network for data transfer, audio/visual cables (to establish connection between mobile phone and television)
5. **Project sample/diversity:** Programs provide materials to over one million children and their teachers; content intended for primary level instruction (BridgeIT, 2013b)
6. **Background and focal area(s) of intervention:** BridgeIT brings teacher training and educational content to teachers and classrooms through mobile phone technology. "BridgeIT teachers receive mobile devices loaded with Nokia's Educational Delivery software that enables them to access a catalogue of educational materials organized by subject and grade level. Teachers can download and share these resources with students through the mobile device, TV, or projector. Teachers receive in-person training and ongoing virtual support to learn how to use the mobile devices and how to effectively engage students" (BridgeIT, 2013b).
7. **Gender/Disability factors:** Pedagogy is gender-responsive (Suraphel, 2012)
8. **Content**
    a. **Type of content/materials covered:** Content is made locally relevant and compliant with local/national educational standards by a group of local teachers, in conjunction with the local BridgeIT team (BridgeIT, 2013a)
    b. **Content production:** Content is developed and contextualized by local and international experts
    c. **Ownership:** Proprietary
9. **Evaluation:** No external evaluation of the BridgeIT program is available. In an internally-sponsored study, learning outcomes were measured and compared between students that participate in BridgeIT's program and a control group, while teachers were evaluated in the classroom both before and after program implementation. This study in Tanzania showed that students in BridgeIT schools scored 10-20 percentage points higher on tests than their control group counterparts (Enge, 2011, p. 3).
10. **Project current status:** Ongoing
11. **Other/Additional information:** The BridgeIT project was originally launched in the Philippines in 2003 with support from IYF, UNDP, and USAID under the project name Text2Teach (BridgeIT, 2013b)

12. Sources:

Project website: http://www.pearsonfoundation.org/great-teaching/programs-great-teaching/bridgeit-mobile-technology-program.html

BridgeIT. (2013a). BridgeIT. In *Center for Education Innovations*. Retrieved from http://www.educationinnovations.org/program/bridgeit

BridgeIT. (2013b). BridgeIT Mobile Technology Program. In *Pearson Foundation*. Retrieved from http://www.pearsonfoundation.org/great-teaching/programs-great-teaching/bridgeit-mobile-technology-program.html

Enge, K. (2011). Elimu kwa Teknolojia Summative Evaluation Executive Summary. Retrieved from http://www.iyfnet.org/sites/default/files/BridgeIT_Eval_Exec_Summary_Jul2011.pdf

Suraphel, S. (2012). 5 mEducation Lessons Learned in BridgeIT Tanzania. *ICTworks*. Retrieved December 4, 2013 from http://www.ictworks.org/2012/08/03/5-meducation-lessons-learned-bridgeit-tanzania/

9. Bridges to the Future Initiative (BFI) – South Africa

1. **Country/Region(s):** South Africa (also in India)
2. **Project owner/partner(s):** Molteno Institute of Language and Literacy (South Africa), in partnership with the International Literacy Institute of the University of Pennsylvania, and support from All Children Reading: A Grand Challenge for Development (ACR – GCD). Before the work in South Africa, BFI focused on out of school children and youth in Andhra Pradesh (India).
3. **Main purpose of the project:** Improve primary-grade literacy through use of interactive, computer-based lessons and train teachers on how to integrate these lessons into existing reading programs
4. **Technology**
    a. **Device(s):** Tablets (not necessarily those that are equipped with communications capabilities) that run the same multilingual software adapted from PC desktop use
    b. **Infrastructure/platform:** Software is in development at present; it will run on browsers that support HTML5
5. **Project sample/diversity:** BFI targets primary school students (grades one through three) and out-of-school youth in after-school programs in Limpopo Province in South Africa. About 50 schools are expected to participate in the project over two years of ACR – GCD funding. The project focuses on literacy learning in Sepedi, Tshivenda, Xitsonga, and English languages.
6. **Background and focal area(s) of intervention:** Reading acquisition through supplementary instruction using tablets, as well as desktop PC-supported instruction
7. **Gender/Disability factors:** Girls and boys, in roughly equal numbers, are expected to participate (Wagner, Daswani, & Karnati, 2010)
8. **Content**
    a. **Type of content/materials covered:** Pre-recorded literacy lessons
    b. **Content Production:** Unknown
    c. **Ownership:** Proprietary, co-owned by the South Africa Department of Education
9. **Evaluation:** An evaluation was undertaken on a computer-based BFI version in India (see Wagner et al., 2010); no evaluation on the mobile platform in South Africa was available at the time of this writing.
10. **Project current status:** Ongoing
11. **Other/Additional information:** Before working in South Africa, BFI focused on out-of-school children and youth in Andhra Pradesh, India

12. Sources:

Project website: http://www.molteno.co.za

International Literacy Institute project website: http://www.literacy.org

Wagner, D.A., Daswani, C.J., & Karnati, R. (2010). Technology and mother-tongue literacy in Southern India: Impact studies among young children and out-of-school youth. *Information technology and international development*, 6(4), 23-43.

World Innovation Summit for Education (WISE) Qatar. (2011). Bridges to the Future Initative. In *Best Practices*. Retrieved from http://www.wise-qatar.org/content/bridges-future-initiative

10. Broad Class: Listen to Learn

1. **Country/Region(s):** Pakistan
2. **Project owner/partner(s):** The Communicators (Pvt.) Limited
3. **Main purpose of the project:** Improve access to quality education for in-school and out-of-school public primary school children using Interactive Radio Instruction (IRI)
4. **Technology**
    a. **Device(s):** Radio; Mobile phone; Computer
    b. **Infrastructure/platform:** Electricity and/or batteries; Mobile network and/or Internet (for live streaming access)
5. **Project sample/diversity:** The in-school program has been piloted in 45 schools in five urban and rural areas of Islamabad, reaching approximately 120 Kindergarten and grade 1 classroom (Results for Development Institute, 2013)
6. **Background and focal area(s) of intervention:** The Broad Class program is a teaching methodology for improving literacy, numeracy, and healthy habits among youth in Pakistan that uses IRI to bring student-centered instruction to primary classes. Audio lessons are led by a "radio teacher" who leads in-class teachers and students through content and activities, pausing throughout the program to allow time for student responses and to prompt the in-class teacher to utilize interactive instructional approaches in the classroom (Results for Development Institute, 2013). Children that are out of school also have access to the lessons via radio. The one-hour broadcasts (30 minutes of interactive lessons, and 30 minutes of health programming, stories, and games) are aired daily, except for Sundays, exam days, and holidays. In addition to the student-centered learning broadcasts, the program provides support to teachers through a three-day in-person training on IRI and implementing these lessons into the classroom, as well as through shorter radio broadcasts with teacher guides (Results for Development Institute, 2013).
7. **Gender/Disability factors:** unknown
8. **Content**
    a. **Type of content/materials covered:** Content is based on the national curriculum and provides instructions in the national language as well as in regional languages (The Communicators, 2013)
    b. **Content production:** Unknown
    c. **Ownership:** Unknown
9. **Evaluation:** A formal evaluation has not been conducted.
10. **Project current status:** Ongoing
11. **Other/Additional information:** None

12. Sources:

The Communicators. (2013, October). *Broad Class – Listen to learn* [PowerPoint slides]. Paper presented at the 2013 mEducation Alliance International Symposium, Washington, DC. Retrieved from http://www.meducationalliance.org/docs/Symposium-2013/Presentations/The%20Communicators_Broad%20Class%20Listen%20to%20Learn%20Presentation.pdf

Center for Education Innovations Programs Database. (2013). Broad Class - Listen to Learn. Retrieved from: http://www.educationinnovations.org/program/broad-class-listen-learn

11. Bunyad Mobile-Based Post-Literacy Program

1. **Country/Region(s):** Pakistan
2. **Project owner/partner(s):** Bunyad Literacy Community Council in partnership with UNESCO and Mobilink Pakistan, and Nokia Pakistan
3. **Main purpose of the project:** Improve literacy retention among newly literate youths, particularly among young rural women, by delivering post-literacy materials via mobile phone
4. **Technology**
    a. **Device(s):** Mobile phone
    b. **Infrastructure/platform:** Electricity and/or rechargeable batteries, mobile data connection
5. **Project sample/diversity:** The first phase of the project targeted 250 adolescent girls in the three districts of Punjab; the second phase targeted 1,250 rural women aged 15-30 (Malik, 2012, p. 6)
6. **Background and focal area(s) of intervention:** The main objective of Bunyad's Mobile-Based Post-Literacy Program is to develop a post-literacy program through which newly literate young women in rural areas of Pakistan are able to practice and retain their new reading skills. Mobile phones are provided free of charge to program participants (contingent upon completion of the six-month program). Text messages containing literacy materials are sent via SMS to these mobile phones 6-8 times a day and program participants are instructed to read the messages, practice writing them in their workbooks, and answer questions (UNESCO, 2012a). The program was launched in the districts of Hafizabad, Sialkot and Lahore in 2009.
7. **Gender/Disability factors:** Focus on educating rural women between the ages of 15 and 30
8. **Content**
    a. **Type of content/materials covered:** English and Urdu language post-literacy material, including primers, teacher training manuals, and charts, which convey messages about literacy, social issues, and the importance of education and the environment
    b. **Content production:** Materials are developed by the Bunyad Foundation
    c. **Ownership:** Messages can be adapted and distributed on a wider scale (UNESCO, 2012b)
9. **Evaluation:** No comprehensive evaluation is available. However, it was reported that 87 percent of the targeted learners (250 learners) were satisfied with their learning after the first the pilot phase of the project in 2009 (Malik, 2012, p. 5). During May-October 2010, the project reported that 1,250 learners from 50 centers became "literate" (*e.g.,* able to read newspapers, solve simple calculation problems involving small amounts of money, read Urdu translations of the Quran, etc.). The parents of female children were also reported to express motivation to send their daughters to schools (Malik, 2012, p. 5). The evaluation results were not supported by detailed analysis of data that were collected.

10. **Project current status:** Ongoing
11. **Other/Additional information:** None

12. Sources:

Project website: http://www.bunyad.org.pk/

Evaluation website: http://www.bunyad.org.pk/Mobile%20Based%20Literacy.htm

Malik, R. (2012). *Mobile based post literacy programme, Phase III: Pre evaluation report.* Retrieved from http://www.bunyad.org.pk/index_files/Pre%20Evaluation%20Report%20of%20Mobile%20Based%20Post%20Literacy%20Phase%20III.docx

UNESCO. (2012a). Bunyad Literacy Community Council (BLCC/BUNYAD), Pakistan. *In Adult Learning and Information Network.* Retrieved from http://www.unesco.org/education/aladin/?menuitem=18&spec=88&member=13

UNESCO. (2012b). *Mobile-Based Post Literacy Programme*. Retrieved from http://www.unesco.org/uil/litbase/?menu=4&programme=125.

12. Digital Education as a Tool of Progress: Electronic Books Pilot Project

1. **Country/Region(s):** Chile
2. **Project owner/partner(s):** Center for Innovation in Education, Chile Foundation in partnership with the Fund for Competitive Innovation (FIC-R) of the Libertador General Bernardo O'Higgins regional government and the Regional Secretary of Education
3. **Main purpose of the project:** Utilize tablets to investigate innovative educational methodologies and promote interest in reading
4. **Technology**
    a. **Device(s):** Tablet or e-reader
    b. **Infrastructure/platform:** Content stored on device; no mention of internet connectivity
5. **Project sample/diversity:** Early primary grades in three regional communities, Chimbarongo, San Vicente de Tagua and Litueche
6. **Background and focal area(s) of intervention:** The project aims to increase teacher capacity and competencies for basic education instruction. In addition to delivering tablets to the communities for use in their Resource Learning Centers, technical assistance and teacher trainings will be a part of the pilot for enhancing practical skills and methodologies oriented towards teaching language and communication (Fundación Chile, 2012).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Content (*e.g.*, local language books) is stored on the devices and can also be accessed by remote support through community libraries and the Biblioredes program (BiblioRedes, 2011)
    b. **Content production:** Unknown
    c. **Ownership:** Unknown
9. **Evaluation:** None
10. **Project current status:** Unknown
11. **Other/Additional information:** Tablets are kept in the Resource Learning Centers of each site
12. **Sources:**

Chile Foundation project website: http://educacionfch.cl/secciones/noticias-cie-fundacion-chile/tic-y-educacion/item/32-proyecto-en-la-sexta-regi%C3%B3n-busca-innovar-en-pr%C3%A1cticas-educativas.html

BiblioRedes. (2011, November 15). *Tres bibliotecas contarán con tablet para sus usuarios*. Retrieved from http://www.biblioredes.cl/node/28810.

Fundación Chile. (2012, February 17). Proyecto en la sexta region busca innovar en prácticas educativas. *Fundación Chile: Centro de Innovación en Educación.* Retrieved from http://educacionfch.cl/secciones/noticias-cie-fundacion-chile/tic-y-educacion/item/32-proyecto-en-la-sexta-regi%C3%B3n-busca-innovar-en-pr%C3%A1cticas-educativas.html

13. Dr. Math

1. **Country/Region(s):** South Africa
2. **Project owner/partner(s):** Meraka Institute, in partnership with the South Africa Council for Scientific and Industrial Research (CSIR)
3. **Main purpose of the project:** Provide out-of-school math tutoring for primary and secondary school students
4. **Technology**
    a. **Device(s):** Mobile phone or computer with Google Talk
    b. **Infrastructure/Platform:** Mobile coverage, electricity, mobile phone battery; functionality replicable via most mobile instant messaging platforms and also via running a Google Talk-compliant instant messaging client on a PC; tutors use Internet workstations
5. **Project sample/diversity:** Primary and secondary school students (Dr. Math, 2013); support is provided mainly in English, though Afrikaans is sometimes used if a tutor knows the language (Vosloo, 2008)
6. **Background and focal area(s) of intervention:** Dr. Math provides math tutoring for primary and secondary school students via mobile phone. Students communicate with tutors using Mxit (social media site) or Google Talk on their mobile phones. Workflow software distributes requests from users to available tutors, who are instructed to guide students in learning instead of simply giving them the answers. Volunteers are usually university students from South Africa. All "conversations" between students and tutors are recorded for research, quality, and security purposes, as well as for potential use in other studies (Dr. Math, 2013). Over 25,000 users have registered since the program's inception in 2007. Dr. Math tutors are available Sundays to Thursdays between 14:00 and 20:00. There are currently 110 volunteer tutors from around the country – most are engineering students from the University of Pretoria (CSIR, 2007).
7. **Gender/Disabilities factors:** Unknown
8. **Content**
    a. **Type of content/materials:** No content created; no material adaptation required
    b. **Content production:** No program content produced; training manual for tutors produced by Dr. Math
    c. **Ownership:** Unknown
9. **Evaluation:** None
10. **Project current status:** Ongoing through support of CSIR and faculty at the University of Pretoria. "The CSIR is currently working on licensing Dr. Math to an independent organisation that will be able to offer the service nationally and grow the initiative to achieve its maximum impact" (CSIR, 2007).
11. **Other/Additional information:** This project highlights the power of social networking in reaching students. However, no real research has been done regarding impacts.

12. Sources:

Project website: http://drmath.meraka.csir.co.za/drmath/

Council for Scientific and Industrial Research (CSIR). (2007). *Dr. Math: A mobile mathematics tutoring system.* Retrieved from http://www.csir.co.za/meraka/Dr_Math.html

Dr. Math. (2013). *How to be a Dr. Math tutor*. Retrieved from http://drmath.meraka.csir.co.za/drmath/how_to_tutor_for_dr_math.pdf

Vosloo, S. (2008, June 27). *Dr. Math going from strength to strength.* Retrieved from http://stevevosloo.com/2008/06/27/dr-math-going-from-strength-to-strength/

14. eEGRA

1. **Country/Region(s):** Mali, Tajikistan, Kyrgyzstan, Philippines
2. **Project owner/partner(s):** Education Development Center (EDC), Inc. in partnership with USAID
3. **Main purpose of the project:** Identify students' individual strengths and weaknesses through a computer- or tablet-based, real-time, student-level literacy assessment
4. **Technology**
    a. **Device(s):** Laptop, netbook, tablet (Lenovo)
    b. **Infrastructure/platform:** Electricity; Microsoft Excel; Internet to send data to central server for storage and higher level analysis
5. **Project sample/diversity:** eEGRA has been adapted to English, French, Russian, and Tajik; actual numbers of students tested using eEGRA are not explicit
6. **Background and focal area(s) of intervention:** eEGRA is an electronic tool developed by EDC as an electronic version of the paper-based EGRA (Early Grades Reading Assessment) (EDC, 2012a). It is a free assessment tool that provides a detailed profile of children's reading ability, and allows educators to track literacy improvement over time. Data entry for eEGRA is done in real time and produces automatic analysis, providing educators with a current snapshot of their students' reading progress (EDC, 2012b).
7. **Gender/Disability factors:** unknown
8. **Content**
    a. **Type of content/materials covered:** Assessment and evaluation forms and generated reports
    b. **Content production:** EDC adapted RTI's version of EGRA for use on mobile devices
    c. **Ownership:** Platform is freely downloadable (except for business use) from the EDC website under a Creative Commons license
9. **Evaluation:** Initially piloted in the Philippines in 2010 and evaluated in 2011 by random assignment into two post-test groups (paper-based and electronic). Differences in subject scores between the two formats were insignificant, indicating the reliability of eEGRA as an alternative to paper-based assessments. The study also found that the electronic version of EGRA was as accurate in assessing literacy as the paper-based version (EDC, n.d.). Baseline data was informed by paper-based EGRA results only, while post-test included data from both paper and electronic assessments. The evaluation was conducted in English only. Further tablet-based field implementations were conducted by JBS International in Kyrgyzstan and Tajikistan (JBS International, 2012), and in Mali by EDC (2012a).
10. **Project current status:** Ongoing; expanding to other countries
11. **Other/Additional information:** Additional pilot planned for Rwanda

12. Sources:

Project website: http://eegra.edc.org/

EDC. (n.d.). *eEGRA factsheet*. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/eEGRA%20Factsheet%20(English).pdf

EDC. (2012a). Helping All Children Read. *eEGRA: Usable reading results- Right now!* Retrieved from http://eegra.edc.org/

EDC. (2012b). *What is eEGRA*? Retrieved from http://eegra.edc.org/en/about/what-is-eegra/.

JBS International. (2012). Review of early-grade reading, teaching and skills: The Kyrgyz republic and Tajikistan.*USAID*. Retrieved from https://www.eddataglobal.org/documents/index.cfm?fuseaction=pubDetail&ID=364

15. FunDza

1. **Country/Region(s):** South Africa
2. **Project owner/partner(s):** The FunDza Literacy Trust
3. **Main purpose of the project:** Popularize reading and improve literacy rates among South African youth by providing access to locally relevant stories accessible via mobile phone
4. **Technology**
    a. **Device(s):** Mobile phone; computer
    b. **Infrastructure/platform:** Stories are accessed via the FunDza mobi network, which uses SMS, and feeds content to the Mxit platform
5. **Project sample/diversity:** FunDza currently works with more than 185 groups that collectively reach more than 130,000 young people (FunDza, 2014b)
6. **Background/Focal area(s) of intervention:** In South Africa, only eight percent of schools have libraries, and books are expensive and often difficult to find. FunDza aims to boost literacy among teens and young adults in South Africa by using mobile technology to provide youth with locally relevant and locally created books and stories (FunDza, 2014b). Rather than providing formal literacy education, the program focuses on popularizing reading by creating demand for reading, removing price and distribution barriers to book access, leveraging the reach of mobile technology, and encouraging readers to become writers and develop further communication skills (FunDza, 2014c). Readers can ask questions, respond to questions, and add comments to stories via the FunDza mobi platform, which is primarily accessed via mobile phone (Beckbessinger, 2012). Over 74,000 unique readers visited the FunDza mobi-library in December 2013 (FunDza, 2014a).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Locally created books and stories, primarily in English, but also in local languages (Beckbessinger, 2012)
    b. **Content production:** Content is either created by FunDza users/readers or is commissioned by FunDza and created by publishing partners and other content providers (FunDza, 2014c)
    c. **Ownership:** Unknown
9. **Evaluation:** No formal evaluation has been conducted.
10. **Project current status:** Ongoing
11. **Other/Additional information:** None
12. **Sources:**

FunDza. (2014a). *#FunDzaFacts*. Retrieved from http://www.fundza.co.za/fundzafacts/

FunDza. (2014b). *The FunDza Literacy Trust*. Retrieved from http://www.fundza.co.za/

FunDza. (2014c). *What We Do*. Retrieved from http://www.fundza.co.za/what-we-do/

Beckbessinger, S. (2012, July 16). *FunDza: an experiment in mobile books.* Retrieved from Ventureburn: http://ventureburn.com/2012/07/fundza-an-experiment-in-mobile-books/

16. Interactive Radio Instruction (IRI) and Interactive Audio Instruction (IAI)

1. **Country/Region(s):** Global
2. **Project owner/partner(s):** Education Development Center (EDC), Inc. in partnership with USAID, World Bank, the Inter-American Development Bank (IDB), Organization of Ibero-American States (OEI), RTI International, FHI 360 (formerly AED), Save the Children, as well as numerous local counterparts
3. **Main purpose of the project:** Provide instruction on various topics (*e.g.,* numeracy, literacy, professional development) in the form of pre-recorded audio lessons disseminated through either radio, CD/MP3 (audio), or Internet
4. **Technology**
    a. **Device(s):** Radio/CD/MP3 player
    b. **Infrastructure/platform:** Electricity, CDs, USBs; streamed content uses Internet connectivity
5. **Project sample/diversity:** Total number of global end users not identified; program can be used both inside and outside of the classroom, and is designed to reach large numbers of teachers and learners who are isolated by distance and poor infrastructure (EDC, 2011)
6. **Background and focal area(s) of intervention:** IRI disseminates educational material on a variety of topics via radio, while IAI disseminates pre-recorded content on-demand via mobile devices that can also be played on portable stereos or tablets (*e.g.,* CDs, USB, mini SD cards), through the Internet (cloud storage site). About 100 pre-recorded audio instruction lessons of 30-45 minutes in length are disseminated via media players (radio, CD player, etc.) in classroom settings as a resource for instructors with guided prompts and built-in learning objectives for both students and teachers aligned with local curricula. Complementary resources are being piloted with the use of tablets and mobile phones. New IRI curricula are adapted to local contexts and languages. Songs, activities and storylines reflect the local culture (EDC, 2009).
7. **Gender/Disability factors:** Gender issues are incorporated throughout curricula as a way of encouraging participation of girls through direct prompts and embedded storylines where female protagonists take on uncommon roles. IRI generally strives to address issues of gender parity by incorporating explicit prompts in the lessons for classroom teachers to call on girls. Also, the storylines often include non-traditional roles for women (athletes, bosses, etc.) as well as present issues related to persons with disabilities.
8. **Content**
    a. **Type of content/materials covered:** Content covers a variety of topics, from early childhood education to adult literacy, and varies by project. Content mainly addresses basic education (reading, writing, math), in addition to topics surrounding youth livelihood training and financial literacy (under the Educational Quality Improvement Program 3 [EQUIP3]). IRI has also been used as a means of distance education for teacher professional development. Programs are adapted to local context, available in local or multiple languages, and are designed to address specific project needs. Gender is a crosscutting theme in curriculum design.
    b. **Content production:** EDC produces content with international curriculum development specialists alongside local project staff and counterparts. Materials are

generally aligned with ministry curriculum objectives or in coordination and under advisement with ministry counterparts and USAID.

c. **Ownership:** Depending on the nature of the grant/contract, produced materials belong to the local government with a duty-free license for EDC to use the intellectual property for adaptation in other regions/countries

9. **Evaluation:** An evaluation report demonstrated positive effect sizes for students participating in IRI in a variety of subjects and grade levels (Ho & Thukral, 2009). The validity of empirical design in assessing learning gains was the most commonly referenced limitation in the assessment findings.
10. **Project current status:** Ongoing; expanding to other areas/regions
11. **Other/Additional information:** A typical IAI program episode might include the following segments: opening; presentation of text for decoding and comprehension activities (a song, rhyme or poem); phonemic, alphabetic and phonetic awareness activities, based on the text or games; decoding, comprehension and fluency activities using targeted text; guided and invented writing activity; consolidation; and closing (EDC, 2011).
12. **Sources:**

Project website: http://idd.edc.org/our_work/technology/interactive-radio-instruction-iri

EDC. (2011). IAI and literacy. *Education development center: International development division website.* Retrieved from http://idd.edc.org/resources/publications/iai-and-literacy

Ho, J. & Thukral, H. (2009). *Tuned in to student success: Assessing the impact of interactive radio instruction for the hardest-to-reach*. Washington: EDC.

17. International Children's Digital Library (ICDL)

1. **Country/Region(s):** Global
2. **Project owner/partner(s):** The ICDL was initially created by an interdisciplinary team at the University of Maryland in cooperation with the Internet Archive
3. **Main purpose of the project:** Increase access to digitalized children's literature from a diversity of cultures
4. **Technology**
    a. **Device(s):** Smartphone, tablet, computer
    b. **Infrastructure/platform:** Internet connection; Apple Operating System (iTunes App); original ICDL content available through web-based content (scanned picture books); now creating digital content specifically designed for iPhones and iPads
5. **Project sample/diversity:** In the first nine weeks that the ICDL was made available on iTunes, iTunes reported 25,000 uses of ICDL from 12,500 unique users. Approximately 50 percent of those users were from the U.S. and the remaining half were from (in order of magnitude): UK, Canada, Australia, Japan, Singapore, Hong Kong, France, Mexico, South Korea, and others (Bederson, Druine, & Quinn, 2009). For the general (non-mobile) ICDL site, ICDL reports the following user diversity: 49,420 adults, 29,102 children; 51,863 females, 26,669 males; 86 percent with English as the preferred language (ICDL, n.d.).
6. **Background/Focal area(s) of intervention:** The ICDL project first launched in 2002 with the aim of increasing access to children's literature from around the world through digitizing picture books and texts. The library now consists of over 4,500 e-books in 61 languages, and more than half of the entire collection includes books in languages other than English, including many multi-language texts (ICDL, n.d.). The conversion of ICDL resources to those that can be accessed through mobile technologies began in 2009, and the current iPhone App includes four picture books (two from the US, one from Palestine and one from Mongolia). Each is available in English or in the native language in which they were written. ICDL has also created a separate iPhone App called StoryKit, which allows children and parents to design and create original stories (adding text, illustrations or pictures, sound effects, etc.).
7. **Gender/Disability factors:** None specified, although ICDL reported more female users than males (ICDL, n.d.)
8. **Content**
    a. **Type of content/materials covered:** Children's stories are produced in local languages and reflective of local culture; however, for the currently available mobile applications, only four books are available, so there is a limited representation of diverse cultures (two from the US, one from Palestine, one from Mongolia)
    b. **Content production:** The four new books were created specifically for mobile applications by ICDL, in partnership with the mobile media company, Zumobi (Bederson et al., 2009)
    c. **Ownership:** Proprietary, although the app is free

9. **Evaluation:** University of Maryland researchers and partners highlighted experiences from the process of co-designing digital libraries, the importance of site-specific knowledge and face-to-face collaboration with users, and the use of optical character recognition software (Druin, Bederson, Rose, & Weeks, 2009). No outcome-based or external evaluations were found. See below for a list of selected research studies.
10. **Project current status:** Apps are currently available; unknown if expansion is anticipated or will include additional stories
11. **Other/Additional information:** None
12. **Sources:**

Project website: en.childrenslibrary.org

Evaluation website: http://en.childrenslibrary.org/about/research/papers.shtml

Bederson, B.B., Druine, A., & Quinn, A. (2009). Designing the reading experience for scanned multi-lingual picture books on mobile phones. *Proceedings of the joint conference on digital libraries*. Retrieved from http://hcil2.cs.umd.edu/trs/2009-06/2009-06.pdf

Bederson, B. B., Druin A., Fails, J., Rose, A., & Weeks, A. (2009). A child's mobile digital library: Collaboration, community, and change. In Druin, A. (Ed.), *Mobile Technology for Children: Designing for Interaction and Learning* (125-146). Morgan Kaufmann Press: Burlington, MA.

Bederson, B. B., Cavallo, D., Druin, A., Fabian, C., Revelle, G., & Rogers, Y. (2009). Mobile technologies for the world's children. *Proceedings of extended abstracts of human factors in computing systems (CHI 2009)*, ACM Press, Panel, (in press).

Druin, A., Bederson, B. B., Rose, A., & Weeks, A. (2009). From New Zealand to Mongolia: Co-designing and deploying a digital library for the world's children. *Special issue of Children, Youth and Environments: Children in Technological Environments: Interaction, Development, and Design*. Retrieved from http://hcil2.cs.umd.edu/trs/2009-02/2009-02.pdf

International Children's Digital Library (ICDL). (n.d.). Library Fast Facts. *About Library*. Retrieved from http://en.childrenslibrary.org/about/fastfacts.shtml

18. Jokko Initiative

1. **Country/Region(s):** Senegal
2. **Project owner/partner(s):** UNICEF in collaboration with Tostan (West Africa NGO)
3. **Main Purpose of project:** Support community empowerment training through the use of mobile phone technology, specifically SMS text messaging, as a pedagogical tool
4. **Technology**
    a. **Device:** Mobile phone
    b. **Infrastructure/platform:** Electricity, SMS-based cell coverage
5. **Project Sample/Diversity:** Tostan manages the Community Empowerment Program in 200 villages in rural Senegal with class sizes of 50-100 people. Twenty of these villages were chosen for the Jokko Initiative. Fifteen individuals across the selected villages were given SMS community forum capabilities; five received mobile instruction but not community forum communication capabilities (comparison villages) (Beltramo & Levine, 2010).
6. **Background and focal area(s) of intervention:** The Jokko Initiative aims to become a practical, low-cost system to encourage group decision-making in Senegalese villages through the use of text message communication. Jokko's RapidSMS Community Forum allows users to send SMS text messages to a "magic number" that then forwards the message to all phone numbers belonging to the network. The program also introduces mobile phones as pedagogical tools to teach and reinforce literacy, as well as the organization and management skills taught in Tostan's Community Empowerment Program. (The Community Empowerment Program is a three-year non-formal education program based on human rights and community empowerment.) The program provides instruction in SMS use and then leverages SMS to empower African communities to access technology, reinforce literacy, build organization and management skills among leaders and build consensus around local development initiatives (UNICEF, 2013).
7. **Gender/Disability factors:** This project focuses on improving literacy for women and girls (80 percent of participants were women or girls) (Beltramo & Levine, 2010)
8. **Content**
    a. **Type of content/materials covered:** Community development and literacy content is developed by implementing organizations; the most popular topics of messages sent via RapidSMS were health and social mobilization (Beltramo & Levine, 2010)
    b. **Content production:** Lessons delivered in local languages (six local languages mentioned), though translated from French; translators noted challenges translating technical terms ("menu", "icon", "navigation", etc.) that lead to misconceptions by students
    c. **Ownership:** Proprietary

9. **Evaluation:** A study conducted by Tostan, UNICEF, and UC Berkeley showed increased literacy skills and usage of SMS for communication by those users with access to RapidSMS Community Forum (Beltramo & Levine, 2010). The evaluation noted that costs to sustain RapidSMS are very high (individuals pay fees to send a message to a single user and then Tostan pays fees related to message forwarding for all other group members). In addition, usage of mobile phones and RapidSMS greatly decreased once classes were over. Even though the goal of the program was identified as literacy learning for community empowerment, the amount of community empowerment that happened as a result of text-message usage was not discussed in detail. It was unclear if community empowerment was the best incentive for improving literacy in this case (Beltramo & Levine, 2010).
10. **Project current status:** Ongoing
11. **Other/Additional information:** The evaluation acknowledged challenges around sustainability because of operating costs for community messaging. However, the report also mentioned that Google introduced a similar community messaging system using Internet-based messaging with no costs.
12. **Sources:**

    Project website: http://www.tostan.org/web/page/593/sectionid/547/pagelevel/3/interior.asp

    Evaluation website:
    http://tostan.org/data/images/project%20jokko%20final%20report%20september%202010.pdf

Beltramo, T., & Levine, D. I. (2010). *Do SMS text messaging and SMS community forums improve outcomes of adult and adolescent literacy programs? Evidence from the Jokko Initiative in Senegal.* Retrieved from http://tostan.org/data/images/project%20jokko%20final%20report%20september%202010.pdf

UNICEF. (2013). Community Forum Using SMS – Jokko Initiative, Senegal. *UNICEF Innovation: Innovate for Children*. Retrieved December 5, 2013 from http://unicefinnovation.org/case-studies/community-forum-using-sms-jokko-initiative-senegal.

19. M-Ubuntu

1. **Country/Region(s):** South Africa
2. **Project owner/partner(s):** M-Ubuntu in collaboration with the MacArthur Foundation, Sprint, Learning Academy Worldwide (Swedish), University of Michigan, di Gameworks, Umlambo Foundation, University of Durban, Volunteers in Technology and Literacy (Vital)
3. **Main purpose of the project:** Engage and empower teachers to address Africa's literacy crisis by using inexpensive, low-threshold mobile phone technology to connect teachers with mLiteracy coaches around the world
4. **Technology**
    a. **Device:** Mobile phone
    b. **Infrastructure/platform:** Internet, electricity
5. **Project sample/diversity:** The 2009-2010 pilot program primarily targeted primary school teachers in South Africa, though teachers of other grades also participated (M-Ubuntu, n.d.b)
6. **Focal area(s) of intervention:** M-Ubuntu encompasses a range of initiatives with several different partners. These include Tribal Tracks, Innovative Runways and Sprint Sparks. Each M-Ubuntu project uses recycled smartphones to provide students and teachers in South Africa with access to teaching and learning content and opportunities to communicate and collaborate with students and teachers around the world. Based on the results of a needs assessment conducted with South African teachers, literacy was identified as a core focus area for the 2009-2010 pilot project, while teachers were also encouraged to develop creative teaching and learning projects using the smartphones. The project currently connects South African teachers with literacy coaches in England, Italy, Sweden and the United States (M-Ubuntu, n.d.b). Content is focused on project-based learning, allowing students to access literature and learning resources through the use of phones to complete collaborative projects (Haagen & van Rensburg Lindzter, 2010).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Science projects (students captured photos of community challenges, such as exploring the possibility of using solar energy to power a stove, literacy [reading and writing activities], etc.); content on mobile phones is provided in English (Haagen & van Rensburg Lindzter, 2010)
    b. **Content production:** M-Ubuntu provides basic infrastructure, and allows end users to access open content (*e.g.* Wikipedia), but content is also created by the end users through uploaded pictures, videos, text, etc. (Haagen & van Rensburg Lindzter, 2010)
    c. **Ownership:** Unknown
9. **Evaluation:** No external evaluation has been completed. However, a small evaluation was undertaken for the MacArthur-funded pilot program in 2010. Findings focused on teacher attitudes and behaviors and did not measure children's literacy outcomes. Comparing pre-test and post-test survey results from participating teachers showed an increase in positive attitudes about the potential of technology to transform teaching and learning in post-test findings, and an increase in desire for additional training in technology. Teachers also indicated that the choice of a familiar device (i.e., mobile phone) eased the process of learning in the new program. The study did not provide results related to improved literacy teaching practices (Haagen & van Rensburg Lindzter, 2010).

10. **Project current status:** Ongoing; the project is currently operating in 15 primary schools in different locations in South Africa
11. **Other/Additional information:** Teachers come from diverse language backgrounds (including Setswana, Tsonga, Sotho, Zulu and Vende)
12. **Sources:**

Project website: http://www.m-ubuntu.org.za

Haagen, L. and van Rensburg Lindzter, T. (July 2010). M-Ubuntu Final Report. Retrieved from http://lawwfoundation.org/lawwf/Archived_News/Entries/2011/12/30_What_happened_when_recycled_mobile_phones_were_made_available_for_learning_in_South_Africa_files/M-Ubuntu_Final_Report.pdf

M-Ubuntu. (n.d.a). Learning Links: M-Ubuntu and the University of Michigan Partnership. Retrieved from http://three.umfglobal.org/resources/1933/M-Ubuntu_one_page_summary.pdf

M-Ubuntu. (n.d.b). M-Ubuntu: Literacy Through Mobile Phones. *About Us*. Retrieved from http://www.m-ubuntu.org/7.html

20. Mobile and Immersive Learning for Literacy in Emerging Economies (MILLEE)

1. **Country/Region(s):** India (other related projects in Sub-Saharan Africa and China)
2. **Project owner/partner(s):** Carnegie Mellon University's Human-Computer Interaction Institute in collaboration with the US National Science Foundation and local partnering NGOs
3. **Main purpose of the project:** Enable children to acquire language literacy through immersive language learning games for use on mobile phones
4. **Technology**
    a. **Device(s):** Mobile phone
    b. **Infrastructure/platform:** Electricity, mobile phone charger and or batteries, multimedia
5. **Project sample/diversity:** Kam, Kumar, Shirley, Mathur & Canny (2009) reported that 27 children (ages 7-14) participated in the pilot study, mostly from "lower castes"
6. **Background/Focal area(s) of intervention:** Started in 2004, MILLEE aims to develop youth reading skills through the use of game-like interfaces on mobile phones. The project focuses on reading, listening, sentence construction, and spelling (writing). It takes a cognitively based approach to teach early-grade reading using mobile-phone based language learning games that are modeled after traditional village games that are locally relevant and familiar to children.
7. **Gender/Disability factors**: Unknown
8. **Content**
    a. **Type of content/materials covered:** The syllabus includes common nouns, verbs, and sentence structures. The curriculum targets listening comprehension, word recognition, sentence construction and spelling. In addition, the game has three features: adopting the style of traditional village games, two levels of hints, and a popular character from localized Sesame Street (Kam et al., 2009).
    b. **Content production:** Created by Carnegie Mellon University in conjunction with local ESL teachers (Kam et al., 2009); the content of the game is tailored to the local context utilizing latest research in language acquisition and a review of 35 commercial language learning packages to identify best practices (Human Development Lab Carnegie Mellon University, n.d.)
    c. **Ownership:** Proprietary
9. **Evaluation:** A series of field studies were conducted between July 2004 and January 2007 with children from the urban slums and rural areas of India (Kam, Ramchandran, & Canny, 2006). The pre- and post-tests administered for the above games show statistically significant gains on small samples. Studies of an after-school program in Uttar Pradesh, India that utilized MILLEE games to assist English instruction showed significant post-test gains after the intervention (Human Development Lab Carnegie Mellon University, n.d.). Kam et al. (2009) reported that the learners with higher initial game test scores improved their scores more than those with lower initial test scores. Conversely, learners with the greatest need for ESL instruction benefited less. Such information concerning stratified differences is useful and uncommon.
10. **Project current status:** Conducting data analysis and revisions; the project is awaiting further funding to complete a full year's worth of lessons (M. Kam interview, February 1, 2013)
11. **Other/Additional information:** The instructional design utilizes multimedia-based games based on the PACE (Pattern-Activity-Curriculum-Exercise) framework. Kumar, Reddy, Tewari, Agrawal, & Kam (2012) suggest that providing hints in games for language learning is like providing

scaffolding lessons for learners. Results from the Indian case study suggest that hints did not sustain motivation for learners.

12. Sources:

Project website: http://www.cs.cmu.edu/~mattkam/lab/millee.html

Human Development Lab Carnegie Mellon University. (n.d.) *Mobile and immersive learning for literacy in emerging economies (MILLEE)*. Retrieved from http://www.cs.cmu.edu/~mattkam/lab/millee.html

Howell, D. C. (2008). *Fundamental statistics for the behavioral sciences*. 6th Ed. Belmont, CA: Thomson.

Kam, M., Ramchandran, D., & Canny, J. (2006). *MILLEE: Mobile and immersive learning for literacy in emerging economies.* Retrieved from http://mikeb.inta.gatech.edu/UCDandIDWorkshop/papers/kam.pdf

Kam, M., Kumar, A., Shirley, J., Mathur, A. & Canny, J. (2009). Improving literacy in rural India: Cellphone games in an after-school program. *ICDT*. IEEE. 2009.

Kumar, A., Reddy, P., Tewari, A., Agrawal, R., & Kam, M. (2012). Improving literacy in developing countries using speech recognition-supported games on mobile devices. In the Proceedings of 3rd Digital Games Research Association International Conference, 1149–1158. http://www.cs.cmu.edu/~mattkam/lab/publications/CHI2010a.pdf

21. MobiLiteracy Uganda

1. **Country/Region(s):** Uganda
2. **Project owner/partner(s):** Urban Planet Mobile in partnership with support from All Children Reading: A Grand Challenge for Development (ACR – GCD)
3. **Main purpose of the project:** Improve child literacy in Uganda by delivering daily reading lessons in the local language via SMS and audio technology to primary adult caregivers
4. **Technology**
    a. **Device(s):** Mobile phone
    b. **Infrastructure/platform:** SMS-based literacy lessons and audio messages
5. **Project sample/diversity:** Caregivers of children in grade one in selected communities in Uganda (Urban Planet Mobile, 2012)
6. **Background/Focal area(s) of intervention:** MobiLiteracy Uganda uses mobile phones and SMS with audio to deliver daily literacy activities to primary caregivers for use with their pre-literate, early-grade children. Audio messages focusing on literacy lessons are sent to adult caregivers of children in grade one. Content is developed in the local language and aims to increase parents' involvement in strengthening their child's literacy skills (All Children Reading, 2011). The audio "push" messages are designed to encourage parents to play an active role in their child's education and the use of both SMS and audio technology allows even illiterate caregivers to participate in the program (Urban Planet Mobile, 2012).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Literacy lessons
    b. **Content production:** SMS-based literacy lessons created by MobiLiteracy Uganda staff and partners
    c. **Ownership:** Proprietary
9. **Evaluation:** None completed at time of review. with ACR – GCD funding, Urban Planet Mobile. Project is currently partnering with RTI International to test the efficacy of SMS with audio in developing literacy and exploring price sensitivity of subscription options (Urban Planet Mobile, 2013).
10. **Project current status:** Ongoing
11. **Other/Additional comments:** None

12. Sources:

Project website: http://www.urbanplanetmobile.com/

All Children Reading. (2011) MobiLiteracy Uganda: Testing and Proving the Efficacy of SMS with Audio in Developing Literacy-Rich Home Environments. *Innovations.* Retrieved from http://allchildrenreading.org/mobiliteracy-uganda-testing-and-proving-efficacy-sms-audio-developing-literacy-rich-home-environment

Urban Planet Mobile. (2012, September 19). *USAID awards urban planet mobile with a grant to develop mobile educational program in Uganda*. Retrieved from http://www.urbanplanetmobile.com/news/usaid-awards-urban-planet-mobile-with-a-grant-to-develop-mobile-educational-program-in-uganda

Urban Planet Mobile. (2013). *MobiLiteracy Uganda: Testing and Providing the Efficacy of SMS with Audio in Developing Literacy-Rich Home Environments in Central Uganda*. Retrieved from http://www.urbanplanetmobile.com/wp-content/uploads/2013/03/MobiLiteracy-Uganda-2013-JPEG_Combine1.pdf

22. MoMaths

1. **Country/Region(s):** South Africa
2. **Project owner/partner(s):** Nokia in partnership with sectors of the South African government (Meraka Institute, Department of Basic Education, Department of Science and Technology, Department of Communications, Presidency) and several private sector partners
3. **Main purpose of the project:** Provides learners and teachers access to interactive mathematics learning materials combined with a social media application for peer-to-peer support through a mobile mathematics service
4. **Technology**
    a. **Device(s):** Mobile phone, tablet, computer
    b. **Infrastructure/platform:** Mobile coverage, electricity, batteries, Internet (program is browser-based)
5. **Project sample/diversity:** MoMaths targets all students in grades 10-12 in South Africa. MoMaths was launched in 2009 with a pilot for 260 grade 10 learners in three provinces of South Africa. As of October 2013, the program had reached 150 schools with around 14,000 students actively using the service. The program is now publicly available (Nokia, 2013).
6. **Background/Focal area(s) of intervention:** MoMaths looks to give South African learners affordable 24/7 access to math instruction on their mobile phones. "Learners [can] work through short theory sections, or answer questions from a database of approximately 10,000 questions, categorized by topic and degree of difficulty (easy, medium, or difficult). Learners [receive] immediate feedback on practice exercises, and [can] compare results with their classmates in their school, in other provinces, and nationally" (Roberts & Vanska, 2011, p. 245). "Exploring equitable access to a mobile learning service was a key consideration of the project. As a result, the project team negotiated with mobile operators to ensure that there was no charge for the service to end users. As with a zero-rated telephone call for emergency numbers, learners could access the mathematics materials at no fee and with zero data transfer costs....the participating operators - MTN and Cell C - paid for the data transfer" (Roberts & Vanska, 2011, p. 246). One-day teacher training sessions were provided for the participating teachers. E-mail communication support was provided after that.
7. **Gender/Disability factors:** None specifically targeted
8. **Content**
    a. **Type of content/materials covered:** Materials developed to align with the grade 10 mathematics curriculum in South Africa
    b. **Content production:** Nokia team re-purposed the curriculum for mobile and online access
    c. **Ownership:** Proprietary; curriculum originally developed by Maskew Miller Longman (part of Pearson), then repurposed by Nokia for mobile access

9. **Evaluation:** According to Nokia (2013), MoMath "has reached 150 schools with around 14,000 students actively using the service. Those students have completed more than four million exercises to date. Of those registered learners, 53 percent became active MoMaths users, with 69 percent of teachers actively using the solution." An internal study in 2010 on the first 24 weeks of the intervention in Grade 10 public schools showed that students who used MoMaths regularly (completing more than 15 practice exercises and tests) received grades 7 percent higher than their peers who did not use the service on a regular basis (United Nations, 2012). No external evaluation has as yet been reported.
10. **Project current status:** Ongoing
11. **Other/Additional information:** Buy-in from government and subsidies from mobile providers seem to be key factors in the scale-up process to date
12. **Sources:**

Project website: http://www.lovelife.org.za/corporate/press/news/nokia-launches-momaths/

Nokia. (2013, October 24). *Nokia Mobile Mathematics empowers South African learners.* Nokia South Africa Blog. Retrieved December 6, 2013 from http://blog.nokia.co.za/press-office/nokia-mobile-mathematics-empowers-south-african-learners/.

Roberts, N., & Vanska, R. (2011). Challenging assumptions: Mobile learning for mathematics project in South Africa. *Distance Education*, 32(2), 243-259.
Retrieved from http://dx.doi.org/10.1080/01587919.2011.584850

United Nations. (2012). Mobile Learning for Mathematics (MoMaths). In United Nations ECOSOC Innovation Fair. Retrieved from http://www.un.org/en/ecosoc/innovfair2011/docs/nokia.pdf.

23. Nokia Life/ Plus

1. **Country/Region(s):** China, India, Indonesia, Nigeria
2. **Project owner/partner(s):** Nokia in collaboration with Reuters Market Light (India), Ministry of Agriculture (Indonesia), Beijing Nongxintong Technology (China), Zain/Airtel and Glo Mobile (Nigeria)
3. **Main purpose of the project:** Offer a wide range of mobile-based information services covering healthcare, agriculture, education and entertainment to bridge the information gap for people in developing contexts, especially those in rural or remote areas
4. **Technology**
    a. **Device(s):** Mobile phone
    b. **Infrastructure/platform:** Electricity, mobile phone charger and/or batteries
5. **Project sample/diversity:** Unknown
6. **Background/Focal area(s) of intervention:** Nokia Life is an SMS-based, subscription-based information service designed to offer a wide range of information services covering healthcare, agriculture, education and entertainment in emerging and developing nations (Nokia, n.d.). Nokia Life Project was launched in India in 2009 and expanded to Nigeria, China, and Indonesia (Koh, 2009). Nokia worked with NGOs, universities, government agencies, and content providers to deliver its services. The educational tools provided simple English and general knowledge courses in local languages, as well as study modules on a variety of state education topics, including history, geography, biology, physics and chemistry. The healthcare services offered advice on pregnancy and childcare, and men's and women's health in all countries.
7. **Gender/Disability factors:** Nokia Life Plus offered gender-specific health content; the availability of gender-specific health information (such as pregnancy advice and female-health advice) benefited women by providing information that might not have been otherwise available
8. **Content**
    a. **Type of content/materials covered:** English language educational content; healthcare services and study modules on a variety of topics (*e.g.,* history, geography, sciences) available in local languages
    b. **Content production:** Nokia Life content was available in local languages and was specific to local conditions and needs as content was developed by local firms and companies in cooperation with local agencies; In Nigeria, content was available in three languages - English, Hausa and Pidgin English; In China, content was available in Mandarin; In India, content was available in English and the regional languages utilized by the content developers
    c. **Ownership:** Proprietary
9. **Evaluation:** Unknown
10. **Project current status:** Project ended
11. **Other/Additional information:** None

12. Sources:

Project website: http://foundationchange.org/nokia-life-tools/

Koh, D. (2009, October 20). Case Study: Nokia Life Tools. *CNET Asia.* Retrieved from http://asia.cnet.com/case-study-nokia-life-tools-62058745.htm

Nokia. (n.d.). FAQ: What is Nokia Life Tools? *Nokia.* Retrieved from http://www.nokia.com/in-en/support/faq/?action=singleTopic&topic=FA132357

24. One Laptop per Child (OLPC) - Ethiopia

1. **Country/Region(s):** Ethiopia
2. **Project owner/partner(s):** One Laptop per Child (OLPC) in partnership with the Engineering Capacity Building Program, GTZ, and Eduvision
3. **Main purpose of the project:** Provide fully-loaded OLPC tablets to every child in two villages in Ethiopia, promote action-oriented, interactive learning among participants, and investigate how the devices affect reading and literacy without the aid of teacher instruction or instructional materials
4. **Technology**
    a. **Device(s):** Motorola Xoom tablets with preloaded apps and content
    b. **Infrastructure/platform:** Solar power charging system
5. **Project sample/diversity:** About forty first grade-aged children in two rural villages in Ethiopia, Wonchi and Wolonchete, about 50 miles from Addis Ababa; participating children had never previously seen printed materials, road signs, or even packaging that had words on them (Talbot, 2012)
6. **Background/Focal area(s) of intervention:** In 2012, tablets with content were sent to two villages ensuring the provision of one laptop per child. However, no instructional manuals or materials were provided. The tablets were provided with solar panels to address the lack of electricity in the villages. The tablet consisted of content like moderately 'curated' games, books, cartoons and movies for the children to explore and play. Each tablet was monitored on a daily basis through a process called 'sneakernet' which involved swapping SIM cards (Negroponte, 2012).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Games, e-books, cartoons, movies; no specific mention of any type of cultural or language adaptation
    b. **Content production:** Content preloaded onto devices; no mention of origin
    c. **Ownership:** Some content available, but does not meet all of the criteria for open-source
9. **Evaluation:** No external evaluation is available although OLPC expects to investigate effects on reading and literacy (Talbot, 2012)
10. **Project current status:** Waiting for funding; according to Negroponte, "If it gets funded, it would need to continue for another a year and a half to two years to come to a conclusion that the scientific community would accept. We'd have to start with a new village and make a clean start" (2012)
11. **Other/Additional information:** OLPC has implemented several other projects in numerous countries; however this is the only OLPC project which has the explicit focus on improving literacy rates among participants. A recent impact study in Peru is also available (see Cristia, Ibarrarán, Cueto, Santiago, & Severín, 2012).

12. Sources:

Project website: http://wiki.laptop.org/go/OLPC_Ethiopia
Cristia, J. P., Ibarrarán, P., Cueto, S., Santiago, A. & Severín, E. (2012). *Technology and child development: Evidence from the One Laptop per Child Program*. IDB Working Paper IDB-WP-304. Washington: Inter-American Development Bank.

Negroponte, N. (2012). EmTech preview: Another way to think about learning. *MIT Technology Review*. Retrieved January 20, 2013 from http://www.technologyreview.com/view/429206/emtech-preview-another-way-to-think-about-learning/

Talbot, D. (2012). Given tablets but no teachers, Ethiopian children teach themselves. *MIT Technology Review.* Retrieved January 20, 2013 from http://www.technologyreview.com/news/506466/given-tablets-but-no-teachers-ethiopian-children-teach-themselves/

25. Open Learning Exchange (OLE) – TeacherMate

1. **Country/Region(s):** Rwanda and Ghana
2. **Project owner/partner(s):** Open Learning Exchange (OLE) and Innovations for Learning
3. **Main purpose of the project:** Train teachers via the TeacherMate Differentiated Instruction System to help their students significantly increase their basic English literacy skills
4. **Technology**
    a. **Device(s):** TeacherMate specific device, computer
    b. **Infrastructure/platform:** Electricity, Internet access for teacher monitoring
5. **Project sample/diversity:** The TeacherMate Differentiated Instruction System was piloted in Rwanda in 2011 by three teachers and 620 students in the 2nd and 3rd grades at a public school in the Gasabo district of Kigali (Mruz, 2011, p. 2); OLE replicated the project in a rural school in Mamobi, Ghana in 2012
6. **Background/Focal area(s) of intervention:** TeacherMates are devices used by individual students to practice literacy skills and are designed to be used daily for literacy and/or numeracy skill development. The TeacherMate Online Management System is software that allows teachers to individualize instruction and monitor student progress on their TeacherMate accounts. The TeacherMate system was created to improve both early literacy and numeracy, although the focus of the early TeacherMate projects in Rwanda has been on English literacy. (In 2009, the official language of instruction for schools in Rwanda was changed to English, posing a challenge to teachers who were trained in French and Kinyarwanda.) The three participating English teachers received training on best practices for implementing TeacherMate in their English classes and on how to use the TeacherMate device (Mruz, 2011, p. 9). Each of the 620 students in the pilot was given their own TeacherMate device to use during their English class and used the device for approximately 40 minutes per week, plus a total of 10 nights of home use (Mruz, 2011, p. 9).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Content is in English and is designed to improve literacy and numeracy skills, though the content used in Rwanda focused on English language literacy. The program has a strong phonics component, which introduces students to basic English phonograms and includes sorting and dictation spelling activities to help students develop the skills needed to decode and spell new words (Mruz, 2011, p. 9).
    b. **Content production:** TeacherMate software was designed in consultation with literacy and math educators. The curriculum was adapted from U.S. curricula and was not aligned to the Rwanda national curriculum (Mruz, 2011, p. 15).
    c. **Ownership:** Open source
9. **Evaluation:** An evaluation of the Rwanda pilot was conducted in 2011. Students' English literacy skills were evaluated at the beginning (January) and the end (October) of the school year using a test adapted from the EGRA. Results showed an average increase of 36 percent among standardized measures of verbal skills for the students using the TeacherMate system, compared with an average increase of 14 percent in each of the two control groups (Mruz, 2011, p. 12). The pilot found that the actual usage of the TeacherMate system was only used at one-third of the recommended capacity within the classroom. This was a result of large class sizes, management

issues with distribution and collection of the TeacherMates, and low attendance rates due to disruptions within the school and academic calendar. Several localization challenges were noted because the TeacherMate system was a software tool adapted from a program originally designed for classrooms in the U.S. Some vocabulary and storylines used were not appropriate for the Rwandan context. Additionally, the curriculum was not aligned with the Rwandan curriculum, which caused competition for time between government standards and test material and the implementation of the TeacherMate system (Mruz, 2011).

10. **Project current status:** Ongoing
11. **Other/Additional information:** None
12. **Sources:**

Project website: http://www.ole.org/content/programs

TeacherMate website: http://www.innovationsforlearning.org/teachermate.html

Mruz, K. (2011). *2011 Rwanda TeacherMate Report*. Cambridge, MA: Open Learning Exchange. Retrieved on December 9, 2013 from http://www.innovationsforlearning.org/resources/content/8/9/documents/Rwanda_TeacherMate_Report.pdf

26. PAJE Nièta (Support to Youth Entrepreneurs Project)

1. **Country/Region(s):** Mali
2. **Project owner/partner(s):** Education Development Center (EDC), Inc. in partnership with USAID
3. **Main purpose of the project:** Provide access to improved basic education, work readiness and technical training, social and leadership development, as well as assistance with livelihood activities via mobile platform-based instruction
4. **Technology**
    a. **Device(s):** Smartphone, Java-enabled mobile phone (current version of Stepping Stone compatible with Nokia S40, C1 series or similar)
    b. **Infrastructure/platform:** Electricity, microSD card
5. **Project sample/diversity:** 12,000 out-of-school, rural Malian youth ages 14-25 in the regions of Kayes, Koulikoro, Sikasso and Timbuktu (Taggart, 2013)
6. **Background/Focal area(s) of intervention:** PAJE-Nièta aims to provide Malian youth with increased access to relevant basic education, work readiness instruction, relevant skills training, entrepreneurship opportunities, and civic engagement through mobile phone-based content provision. As an associate award of the Educational Quality Improvement Program 3 (EQUIP3), the five-year project started in October 2010, and offers "literacy and numeracy training integrated with agri-business support services, business training, and audio instruction using a mobile platform created by EDC called 'Stepping Stone'" (Taggart, 2013). Stepping Stone is a mobile content development platform which allows a teacher or curriculum developer to create a series of slides viewable on a mobile phone by dragging and dropping components into place; this multimedia can be loaded onto phones and played back as lessons (Stepping Stone, n.d.).
7. **Gender/Disability factors:** Gender issues are cross-cutting; no specific mention of consideration for participants with disabilities
8. **Content**
    a. **Type of content/materials covered:** Available content includes: Reading and writing in Bambara (local language), math and work readiness, and functional French; English, French and Bambara languages are currently supported through the platform (Stepping Stone, n.d.)
    b. **Content production:** EDC develops and supports the development of content; phones are pre-loaded with 'Learn to Read' at access kiosks and new lessons are distributed on MicroSD cards which are available for purchase (Stepping Stone, n.d)
    c. **Ownership:** Open source; developed with open-source code library content; phone emulator component (similar to print preview for slide production) is 100 percent code share
9. **Evaluation:** No evaluation of the learning outcomes related to the PAJE-Nièta has been reported. One informal report states that 56 percent of youth who completed technical training with the PAJE-Nièta project have gone on to successfully start a micro-enterprise (Taggart, 2013).

10. **Project current status:** Ongoing; EDC is currently piloting the project in four regions of Mali

11. **Other/Additional information:** Females outnumber male youth two-to-one as participants in the project, and in starting agriculture-based income generation activities. Young women, however, have reported lower profits and as a result, EDC has begun to study factors relating to resource availability to learn more about gender differences within youth livelihoods (Taggart, 2013).
12. **Sources:**

Project website: http://idd.edc.org/projects/mali-support-youth-entrepreneurs-project-paje-nieta.

Education Development Center (EDC). (2012). EDC to Share Expertise in m-learning at International Symposium. Retrieved December 12, 2013 from http://www.edc.org/newsroom/press_releases/edc_share_expertise_m-learning_international_symposium.

Stepping Stone. (n.d.). *Mobile phone based learning platform: Stepping Stone* [Video file]. Retrieved from http://paje.edc.org/.

Taggart, N. (2013, August 15). "Preparing Youth for Employment." *USAID Impact Blog.* Retrieved December 13, 2013 from http://blog.usaid.gov/2013/08/preparing-youth-for-employment/.

27. PAJEF Literacy Classes

1. **Country/Region(s):** Senegal
2. **Project owner/partner(s):** UNESCO in partnership with Proctor & Gamble and with support from the Sankoré program (joint partnership between the Public Interest Group for Digital Education in Africa (GIP ENA), the French Ministry of Foreign Affairs, and UNESCO Dakar
3. **Main purpose of the project:** Improve access to education and literacy among neo-literate and illiterate women and girls in Senegal by introducing digital kits into literacy-focused classes
4. **Technology**
    a. **Device(s):** Mobile phone, Internet, CD/DVD
    b. **Infrastructure/platform:** Mobile phone network service, Internet, electricity, mobile phone charger and/or batteries
5. **Project sample/diversity:** In 2012, PAJEF opened 260 classes for about 4,000 illiterate women; trained 110 teachers to teach PAJEF courses; trained 23 regional literacy officials in monitoring evaluation and management; and trained 66 literacy coaches, 45 literacy workers, 40 outreach workers, and four supervisors (UNESCO, n.d.)
6. **Background/Focal area(s) of intervention:** Launched in January 2012 and spanning two years, PAJEF aims to improve access to education for 4000 neo-literate and illiterate women aged 15-55 years. The program runs in seven regions with the highest rates of illiteracy: Diourbel, Fatick, Kédougou, Matam, Saint-Louis, Tambacounda and Dakar, and offers literacy programs available on television, audio CD, online, and on mobile applications in both French and local languages. Teachers are trained to use mobile phones and the Internet to train young girls and women to read, write, and calculate (UNESCO, 2012). In 2013, PAJEF introduced 200 digital kits containing laptops, interactive beamers, infrared stylus touch pens, and adapted software from the Sankoré program into the PAJEF classrooms to enhance literacy instruction, as well as to teach computer skills and lessons about issues of nutrition, health, and the environment (UNESCO, 2013).
7. **Gender/disability factors:** PAJEF classes are open exclusively to women and girls (UNESCO, 2011)
8. **Content**
    a. **Type of content/materials:** Unknown although content has been developed for training teachers
    b. **Content production:** Unknown
    c. **Ownership:** Unknown
9. **Evaluation:** An evaluation to analyze the efficiency of the newly introduced digital kits is expected at the end of 2013 (UNESCO, 2013)
10. **Project current status:** Ongoing
11. **Other/Additional information:** UNESCO has announced the extension of the project to Kenya and Nigeria (UNESCO, n.d.)

12. Sources:

Project website: http://www.unesco.org/new/en/dakar/about-this-office/single-view/news/100_literacy_classes_for_girls_and_women_open_in_senegal/

UNESCO. (n.d.). *Project to boost literacy among girls and women in Senegal.* UNESCO Office in Dakar. Retrieved from http://www.unesco.org/new/en/dakar/education/literacy/literacy-project-for-young-girls-and-women-in-senegal-pajef/.

UNESCO. (2011). UNESCO and Procter & Gamble launch partnership to promote education for young girls and young women. *UNESCO Media Services.* Retrieved from http://www.unesco.org/new/en/media-services/single-view/news/unesco_and_procter_gamble_launch_partnership_to_promote_education_for_young_girls_and_young_women/

UNESCO. (2012). 100 literacy classes for girls and women open in Senegal. *UNESCO Office in Dakar.* Retrieved from http://www.unesco.org/new/en/dakar/about-this-office/single-view/news/100_literacy_classes_for_girls_and_women_open_in_senegal#.UgQAS9Ip-So /

UNESCO. (2013, June 7). *Literacy project for girls and women in Senegal goes digital.* UNESCO Education. Retrieved from http://www.unesco.org/new/en/education/resources/online-materials/single-view/news/the_literacy_project_for_girls_and_women_in_senegal_pajef_goes_digital/#.UqovhPRDsQE.

28. PHARE Program (Programme Harmonisé d'Appui au Renforcement de l'Education)

1. **Country/Region(s):** Mali
2. **Project owner/partner(s):** Education Development Center (EDC), Inc. in collaboration with USAID
3. **Main purpose of the project:** Increase access to basic quality education and improve reading and writing skills through mobile device-based instruction, assessment and teacher professional development for improving French literacy instruction
4. **Technology**
    a. **Device(s):** Radio/Audio, mobile phones; also uses pico projectors
    b. **Infrastructure/platform:** Electricity, Internet connectivity (for data transfer, not administration)
5. **Project sample/diversity:** The national project reached 500,000 students and over 12,000 teachers in 40,000 elementary level (grades 1-6) classrooms (EDC, n.d.b)
6. **Background/Focal area(s) of intervention:** This five-year project (2008-2013) worked with the Ministry of Education in all eight Malian regions to increase access to basic quality education, focusing on improving reading and writing skills. Known as "Road to Reading" in English, the program produced and broadcasted 720 Interactive Radio Instruction (IRI) programs for grades 1–6 with dual instructional objectives for teachers and students. The program also strived to improve the Ministry's evaluation systems, particularly around reading and writing. Further efforts will improve pre-service and in-service teacher training and supervisory practices. New technologies, such as smartphones and mini-computers, will be adapted to the Malian context and those that prove most effective will be scaled up through public-private partnerships (EDC, n.d.a). "PHARE conducted a pilot with Internet-enabled mobile phones to offer teachers access to reading lesson resources and suggested lesson plans and to ask supervisors to observe the lessons taught based on these resources and to send feedback. PHARE's main target audience with the phones was primary grade teachers" (R. Rhodes, personal communication, February 6, 2013).
7. **Gender/Disability Factors:** No direct reference to a gender focus; according to the EDC report (n.d.a), "pilot programs will help develop a model for reaching nomadic populations and children with mild to moderate special needs."
8. **Content**
    a. **Type of content/materials covered:** French literacy programming delivered via interactive radio instruction; emphasis on reading and writing assessment and teacher professional development for French literacy and writing
    b. **Content production:** Developed by EDC curriculum development specialists in collaboration with Ministry of Education counterparts (R. Rhodes, personal communication, February 6, 2013)
    c. **Ownership:** Unknown
9. **Evaluation:** None
10. **Project current status:** Suspended due to the US government's inability to interact with the transition government, which extends to Ministries and schools (N. Devine, personal communication, February 6, 2013)
11. **Other/Additional information:** None

12. Sources:

Project website: http://idd.edc.org/projects/mali-usaidphare-program-programme-harmonisé-dappui-au-renforcement-de-leducation

EDC. (n.d.a). Mali road to reading program. *EDC's International Development Division.* Retrieved from http://idd.edc.org/sites/idd.edc.org/files/Mali%20Road%20to%20Reading%20Program%20(PHARE).pdf

EDC. (n.d.b). Mali USAID/PHARE Program (Programme Harmonisé d'Appui au Renforcement de l'Education). *EDC International Development.* Retrieved from http://idd.edc.org/projects/mali-usaidphare-program-programme-harmonis%C3%A9-dappui-au-renforcement-de-leducation

29. PIEQ (Package for Improving Education Quality)

1. **Country/Region(s):** Democratic Republic of the Congo (DRC)
2. **Project owner/partner(s):** Education Development Center (EDC), Inc. in partnership with Catholic Relief Services, DRC's National Ministry of Education (MNE), New Generation Media Initiatives for Africa, RTI International, and USAID
3. **Main purpose of the project:** Build the capacity of teachers, schools, and communities in three Congolese provinces to increase student learning by improving teaching and the school environment
4. **Technology**
    a. **Device(s):** Radio, audio
    b. **Infrastructure/platform:** Airwave broadcast, wind up radios
5. **Project sample/diversity:** 3,000 schools, 21,000 teachers, and 900,000 students across three provinces in the DRC (EDC, n.d.b)
6. **Background/Focal area(s) of intervention:** Through collaboration with the DRC's National Ministry of Education (MNE), the Package for Improving Education Quality (PIEQ) supports a carefully designed course for professional development to build teachers' knowledge in specific subject areas and skills in student-centered teaching. In addition, PIEQ extends an already existing Interactive Radio Instruction (IRI) series from the grade 1 and 2 programs through grade 6, ensuring that students receive quality daily lessons based on the Congolese curriculum, and that teachers receive support in practicing the interactive techniques they learn in training. Communities in the three target provinces of Bandundu, Orientale, and Equateur also play an integral part in improving learning for their children; the program trains parent groups in the planning and implementation of school improvement projects. Schools and communities are organized geographically in clusters to allow for mutual support in undertaking their projects (EDC, n.d.a).
7. **Gender/Disability factors:** unknown
8. **Content**
    a. **Type of content/materials covered:** PIEQ content is based on the Congolese curriculum and focuses on French and math
    b. **Content production:** Produced locally through EDC in collaboration with the DRC MNE
    c. **Ownership:** Unknown
9. **Evaluation:** A comparison of participants' pre- and post-training results shows a 28 percent gain (EDC, n.d.a); specific indicators and data reflecting student learning gains were not referenced.
10. **Project current status:** Project will continue to be implemented until August 2014 (EDC, n.d.b)
11. **Other/Additional information:** None

12. Sources:

Project website: http://idd.edc.org/resources/publications/drc-package-improving-education-quality-pieq

EDC. (n.d.a). DRC package for improving education quality. *EDC's International Development Division.* Retrieved December 10, 2013 from http://idd.edc.org/sites/idd.edc.org/files/DRC%20PIEQ.pdf

EDC. (n.d.b). EDC Expands Its Support for Quality Education in the Democratic Republic of the Congo. *EDC News.* http://idd.edc.org/about/news/edc-expands-its-support-quality-education-democratic-republic-congo

30. PlanetRead

1. **Country/Region(s):** India
2. **Project owner/partner(s):** PlanetRead in partnership with Indian Institute of Management, Ahmedabad [IIMA]), Birla Institute of Management Technology, the Department of Education under the Ministry of Human Resource Development, the Development and Educational Communication Unit of the Indian Space Research Organization, and the Government of India, and support from All Children Reading: A Grand Challenge for Development (ACR – GCD)
3. **Main purpose of the project:** Develop reading and literacy skills around the world by applying Same Language Subtitling (SLS) to music videos, television programs, and movies
4. **Technology**
    a. **Device(s):** Television
    b. **Infrastructure/platform:** Electricity and/or battery
5. **Project sample/diversity:** PlanetRead's SLS programs have reached 216 million beneficiaries in eight languages, 42.3 million of whom were children (PlanetRead, 2012)
6. **Background/Focal area(s) of intervention:** The program was first implemented in the state of Gujarat, India (Kothari, Pandey & Chudgar, 2004, p. 23-24), where SLS of song lyrics in Gujarati were added to music videos shown on an existing 30 minute-long weekly program called Chitrageet. A study of the Gujarat program showed that exposure to SLS on TV for 30 minutes per week over a six-month period led to measureable improvement in reading skills among adults (Kothari, 2008, p. 776).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Hindi language texts from Hindi film songs combined with same language subtitles to encourage viewers to read while watching the videos and listening to the songs
    b. **Content production:** Unknown
    c. **Ownership:** Unknown
9. **Evaluation:** Research conducted at the Indian Institute of Management, Ahmedabad found that SLS improves reading ability by strengthening decoding capacity and habituating fluidity. SLS exposure was found to raise the rate of newspaper reading among "literate" youth from 34 percent to 70 percent (PlanetRead, 2012, p. 6). No external evaluations of SLS have been reported to date.
10. **Project current status:** Ongoing
11. **Other/Additional information:** None

12. Sources:

Project website: http://www.planetread.org/literacy.php

Kothari, B., Pandey, A. & Chudgar, A. (2004). Reading out of the "Idiot Box": Same-language subtitling on television in India. *Information technologies and international development*, Volume 2, Number 1, 23–44.

Kothari, B. (2008). Let a billion readers bloom: Same language subtitling on television for mass literacy. *International Review of Education,* Volume 54. 773-780. Retrieved from http://www.unesco.org/uploads/media/confinteavi_ws1-6_billion-readers_en.pdf

PlanetRead. (2012). PlanetRead Annual Report 2012. Retrieved December 10, 2013 from http://www.planetread.org/pdf/Annual%20Report-PR-2012.pdf.

31. Pratham – Learn, Out of the Box

1. **Country/Region(s):** India
2. **Project owner/partner(s):** Pratham Education Foundation in partnership with Vodafone Foundation India
3. **Main purpose of the project:** Enhance teaching and learning in low-income schools through the introduction of technology as a teaching tool
4. **Technology**
    a. **Device:** WebBox – a smartphone repackaged as a keyboard, with a 600 MHz processor that runs on Android 2.1 OS developed by the Vodafone Group; the device includes AV cables that plug into a television (also provided), and is Internet-enabled through a 2G SIM card (Pratham, 2009)
    b. **Infrastructure/platform:** Electricity, 2G cell service
5. **Project sample/diversity:** The project targets economically disadvantaged students in upper-primary grades at under-resourced English and Hindi Medium schools, and aims to reach 1,000 schools across 12 states of India (Pratham, 2009); the first phase launched in January 2013 in 150 schools and Phase 2, which was being rolled out at the time of research, will expand the program to an additional 849 new schools (Pratham, 2013a)
6. **Background/Focal area(s) of intervention:** The WebBox delivers content to teachers to be used during lesson planning or classroom instruction. It is equipped with a learning application for the classroom that contains digital content and aligns with the state curriculum. The digital content includes videos, slideshows and classroom activity ideas that do not require Internet connectivity because they are stored directly on the WebBox. The project is not meant to replace the teacher, but rather, it exists to support effective teaching and supplement existing materials. The project also supports "holistic teacher training" and "ongoing teacher guidance including lesson-planning support" (Center for Education Innovations, n.d.). When Phase 1 was implemented in 2012, the project targeted math and science classrooms (Pratham, 2012).
7. **Gender/disability factors:** Unknown
8. **Content**
    a. **Type of content/materials:** The project developed curricular materials including videos, slideshows and classroom activities
    b. **Content production:** Content was created by a Pratham content team in Delhi following collaboration with faculty at Harvard Graduate School of Education
    c. **Ownership:** Proprietary

9. **Evaluation:** Catalyst Management Services (CMS) a third party Monitoring-and-Evaluation agency carried out a prototype evaluation in 10 schools from Mumbai and Mysore with focus groups and one-on-one interviews. (Pratham, 2013). To date, qualitative results suggest that both students and teachers felt more motivated to learn using the WebBox.
10. **Project current status:** Ongoing
11. **Other/Additional information:** None
12. **Sources:**

Project website: http://www.learn-outofthebox.org/

Center for Education Innovations. (n.d.). Pratham Learn, Out of the Box. *Center for Education Innovations Programs*. Retrieved from http://www.educationinnovations.org/program/pratham-learn-out-box

Pratham. (2009). *Digital Classrooms.* Retrieved December 11, 2013 from http://www.pratham.org/M-76-3-Digital-Classrooms.aspx

Pratham. (2012, June 9). The Plan and Phase 1. *Learn, Out of the Box*. Retrieved from http://www.learn-outofthebox.org/2012/06/plan-and-phase-1.html.

Pratham. (2013). Prototype evaluation. *Learn, Out of the Box.* [Slideshow Presentation]. Retrieved from http://www.learn-outofthebox.org/2013/07/prototype-evaluation.html

32. Radiophone Project

1. **Country/Region(s):** India
2. **Project owner/partner(s):** Sesame Workshop India in collaboration with Qualcomm Inc., Schwab Charitable Fund, and HSBC
3. **Main purpose of the project:** Expand access to quality education for children ages 2-8 in migrant labor communities in India through combining community radio with mobile phone capabilities
4. **Technology**
    a. **Device(s):** Radio, Mobile phone
    b. **Infrastructure/platform:** FM radio reception, Mobile phone service, Internet
5. **Project sample/diversity:** Children aged 2-8 in rural and under-resourced areas of India; pilot focused on children of migrant populations residing in Gurgaon, India, a suburb of New Delhi (Qualcomm, 2011)
6. **Background/Focal area(s) of intervention:** The Radiophone Project began in 2011 by broadcasting 31 episodes of *Galli Galli Sim Sim* (GGSS; the Indian version of Sesame Street) on a community radio station in Gugaon, India and now is relayed to more communities through 10 diverse community radio stations in north and central India (The Communication Initiative, 2013). The program is accessible via FM radio and via mobile phones (Sesame Workshop, 2012). Listeners can use 3G-equipped phones to stream GGSS radio shows on demand by calling a number that then calls them back and plays an episode and provides access to related videos and print materials that reinforce the messages of the radio programs (Sesame Workshop, 2012). There are three main components to the Radiophone project: "the development and broadcast of high quality educational radio content relevant to and reflecting community issues, especially those of marginalized communities; enabling increased access of this content to communities through integration with a 3G enabled platform; and an in-school program that leverages the radio broadcast within school learning materials" (Qualcomm, 2011).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Ninety-one episodes of Sesame's GGSS radio program on health, hygiene, nutrition, and socio-emotional wellbeing localized and aired on 10 community radio stations in North and Central India (The Communication Initiative, 2013)
    b. **Content production:** Content is produced by Sesame Workshop
    c. **Ownership:** Proprietary
9. **Evaluation:** None
10. **Project current status:** Ongoing
11. **Other/Additional information:** None

12. Sources:

Project website: http://www.unesco.org/new/en/unesco/themes/icts/m4ed/unesco-mobile-learning-week/webinar/anita-stewart/

The Communication Initiative. (2013, January 25). *Galli Galli Sim Sim Radiophone Project*. ICT for Development Network. Retrieved December 11, 2013 from http://www.comminit.com/ict-4-development/content/galli-galli-sim-sim-radiophone-project.

Qualcomm. (2011, August 30). Qualcomm and Sesame Workshop India launch project using 3G mobile technology to provide quality, early learning experiences for underserved migrant children. Retrieved from http://www.qualcomm.com/media/releases/2011/08/30/qualcomm-and-sesame-workshop-india-launch-project-using-3g-mobile

Sesame Workshop. (2012, August 8). Helping life-saving lessons reach marginalized Indian communities. Retrieved from http://www.sesameworkshop.org/our-blog/2012/08/08/helping-life-saving-lessons-reach-marginalized-indian-communities/

33. Real-time Access and Utilization of Children's Learning Data

1. **Country/Region(s):** Ghana, Haiti
2. **Project owner/partner(s):** The Earth Institute at Columbia University in partnership with the Modi Research Group, Millennium Villages, and the MDG Centre
3. **Main purpose of the project:** Use mobile technology to measure literacy skills among school-age children and to use the data from these assessments to inform communities and prepare remedial interventions
4. **Technology**
    a. **Device:** Mobile phone
    b. **Infrastructure/platform:** Android platform; formhub online platform; Internet and/or mobile phone service
5. **Project sample/diversity:** The tool was piloted in Haiti in 2012. Fifty children were assessed, 40 of whom were enrolled in traditional schools (either public or private) and 10 of whom were enrolled in a new special program (Muffly, 2013).
6. **Background/Focal area(s) of intervention:** The Real-time Access and Utilization of Children's Learning Data uses mobile technology to conduct literacy and numeracy assessments in the field. The Earth Institute uses Formhub, an online platform, for authoring surveys that can then by uploaded to Android mobile phones and used to collect data. Assessment tests are administered (orally) one student at a time, and the assessor plugs the data into the mobile phone. Once the phones have access to Internet, the surveys are sent electronically back to Formhub, where the data is organized and disseminated (Muffly, 2013). The program was piloted in Haiti in 2012 and is currently being used in Ghana, as well as at other Millennium Villages in Africa for monthly data collection and assessment (The Earth Institute, 2014).
7. **Gender/disability factors:** Unknown
8. **Content**
    a. **Type of content/materials:** No reading content is produced; surveys for literacy and numeracy assessments are developed to be locally relevant and tests are based on those used by the ASER Centre in India and Uwezo in East Africa (The Earth Institute, 2014)
    b. **Content production:** Surveys are developed by the Earth Institute using formhub
    c. **Ownership:** Proprietary
9. **Evaluation:** None
10. **Project current status:** Ongoing
11. **Other/Additional information:** None

12. Sources:

Muffly, S. (2013). *Literacy Assessment Using Mobile Technology.* Retrieved from http://cgsd.columbia.edu/files/2013/05/Haiti_literacy_assessment_policy_brief.pdf

The Earth Institute. (2014, January 15). Real-time access and utilization of children's learning data: Case study from the Millennium Villages Project [video file]. Retrieved from http://www.meducationalliance.org/content/featured-video-real-time-access-and-utilization-childrens-learning-data-earth-institute-colu

34. SenMobil – Kindergarten Mobile Learning

1. **Country/Region(s):** Senegal
2. **Project owner/partner(s):** SenMobile
3. **Main purpose of the project:** Provide mobile learning applications with local content for kindergarten children and support teachers who have very large classes
4. **Technology**
    a. **Device(s):** Smartphone **(**Blackberry), feature phones
    b. **Infrastructure/platform:** Cellular and Internet interfaces
5. **Project sample/diversity:** Ninety Kindergarten students in three primary schools (Scharff, 2012, p. 6)
6. **Background/Focal area(s) of intervention:** Kindergarten classes in Senegal are generally very large, making it difficult for teachers to provide students with individual attention and to track student progress. SenMobile develops mobile applications for kindergarten students in Senegal that work on both feature phones and smartphones. SenMobile also utilizes SMS capability for parent and teacher monitoring (SenMobile, 2012).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Content covers math (basic geometric shapes and numbers), reading (letters, alphabets, and color names), and civic competency (hygiene and malaria awareness) in French and local languages (Wolof, Poulard, and Bambara)
    b. **Content production:** SenMobile is a series of JAVA Platform, Micro Edition applications designed in Senegal, and downloadable from the Nokia Store free of charge
    c. **Ownership:** Private, in collaboration with partners such as the University of Thies
9. **Evaluation:** The pilot study included more than 90 pupils using 20 Blackberry phones in three schools in Senegal (SenMobile, 2012). It is not clear how phones were distributed or how much time in a given school day or week was dedicated to the project. Measured outcomes were not provided. However, Scharff (2012) reported that students were "proud" of the learning experience and that they were "motivated by mobile phones."
10. **Project current status:** Ongoing
11. **Other/Additional information:** The project website reflects what the project would like to achieve, but it is unclear how many of the goals have been achieved to date

12. Sources:

Project website: http://www.senmobile.com/officialsenmobile/index.php/en/elearning-en

Scharff, C. (2012). Introducing mobile learning in kindergartens in Senegal [Powerpoint slides]. Retrieved from http://www.slideshare.net/senmobile/early-education-13129536#btnNext

SenMobile. (2012, May 24). Introducing mobile learning in kindergartens in Senegal [Video File]. Retrieved from http://www.youtube.com/watch?feature=player_embedded&v=BHw9SOaOGCg.

35. Shellbook Localization Systems

1. **Country/Region(s):** Burundi and East Africa
2. **Project owner/partner(s):** Life Access Technology Trust in collaboration with World Vision
3. **Main purpose of the project:** Facilitate the development of learner-generated teaching and learning materials by providing customizable digital resources that can be adapted to address local languages and contexts
4. **Technology**
    a. **Device(s):** Computer (or laptop) that can be connected to the Internet
    b. **Infrastructure/platform:** Electricity and/or batteries, Wi-Fi/Internet cable connection
5. **Project sample/diversity**: Unknown
6. **Background/Focal area(s) of intervention:** Shellbooks are short digital resource publications that are distributed for local adaptation by end-users before printing. A Shellbook or "learning shell" is a principled framework in which quality information and training resources are created by topic specialists, distributed for localization by communities, and stored in digital libraries at a low cost, available for print-on-demand and further adaptation by the community as needed. Between 1993 and 2003, Papua New Guinea's Elementary Reform utilized Shellbooks to assist communities speaking 435 different languages to localize K-2 curricula for use in their village elementary schools (Life Access Technology Trust, n.d.). The ultimate goal is to use the Shellbook knowledge sharing resource model and Shellbook technology to fully empower communities to create their own teaching and learning materials (Trainum, 2009).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Shellbook Localization Systems adapt small booklets and highly illustrated materials that local volunteers can employ to teach children and parents; materials include flip charts, big books, games, flash cards, booklets, stories, audio dramas, lesson plans, monitoring and evaluation tools, etc., and emphasis is placed on locally adapting these materials to match the context of the place in which they are used (World Vision International, 2013)
    b. **Content production:** World Vision produces the content; the Shellbook Localization System follows three stages of production: (1) the best practice resource materials are adapted into easy-to-use formats, or Shellbook templates, for community volunteers; (2) templates are added to the Shellbook repository to be shared online; (3) the Shellbook templates are then adapted by local community volunteers; materials are later printed and copied at local LAMP (Local Area Materials Production) Centers (World Vision International, 2013)
    c. **Ownership:** Open source
9. **Evaluation:** None
10. **Project current status:** Ongoing
11. **Other/Additional information:** None

12. Sources:

Project website: http://www.wvshellbooks.org/

Life Access Technology Trust. (n.d.). About the Shellbook System. *Life Access Technology Trust.* Retrieved December 12, 2013 from http://www.lifeaccesstech.org/shellbook-system.html.

Trainum, M. (2009, September 17). *Graduate Institute of Applied Linguistics Forum*. Life Access Technology Trust. Retrieved December 12, 2013 from http://lifeaccesstech.wordpress.com/category/shellbook-method/.

World Vision International. (2013). *What are Shellbooks.* WVI Global Learning Resources. Retrieved December 12, 2013 from http://www.wvshellbooks.org/Shellbooks_Introduction_and_Training/1._What_Are_Shellbooks.

36. Sistema Uno

1. **Country/Region(s):** Latin America (currently in Mexico, Argentina, Brazil, Colombia, Ecuador, El Salvador, Guatemala and Honduras)
2. **Project owner/partner(s):** Grupo Santillana (Ecuador; non-governmental consortium of curriculum developers and textbook editors) in partnership with UNESCO, Cambridge ESOL, Apple, Discovery Education, and Animal Planet, among others
3. **Main purpose of the project:** Offer a combination of educational solutions integrated into technologies and organization and evaluation strategies which are designed to respond to the interests and identity of each educational institution (Santillana Ecuador, 2011)
4. **Technology**
    a. **Device(s):** iPad tablets
    b. **Infrastructure/platform:** iOS, the operating system for iPad; Website content is preloaded onto the devices; no mention of use of Internet or wireless
5. **Project sample/diversity:** Sixty-five thousand students in 240 private preschool and primary grade institutions and 4,500 teachers have received in-person training regarding administering the program (Mexican sample) (Gutiérrez, 2012)
6. **Background/Focal area(s) of intervention:** General instruction across subjects integrated with teacher management and evaluation solutions for contextualized feedback of student progress. Sistema Uno offers 76 different apps covering 20 different subjects. Some of the apps are free and some must be purchased for a fee of up to $199. It is not clear what role the project has had in designing some of the apps as some are from a 3rd party vendors (Prezi, Evernote, etc.).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Pedagogy comprised of two programs: SE (Educational System by skills with achievement criteria) and BE (Bilingual English Program). SE integrates learning skills with the development of knowledge content in the mother tongue (Spanish); BE guarantees the use of English as a common language within the school so the students are exposed to a bilingual environment. Furthermore, as permanent, cross-cutting processes, the system manages a digitization of the schools' data, the continuous training of the educational community and the constant evaluation of its actions.
    b. **Content production:** The curriculum was developed by Grupo Santillana specialists and endorsed by the Mexican Secretariat of Public Education
    c. **Ownership:** Proprietary
9. **Evaluation:** None
10. **Project current status:** Ongoing; expanding to other areas
11. **Other/Additional information:** Most of the content available online is related to teacher training on the platform and its administration

12. Sources:

Project website: http://www.sistemauno.com/web/quienessomos.html

Gutiérrez, V. (2012, February 16). Buscan cambiar el sistema educativo en México. *El Economista*. Retrieved from http://eleconomista.com.mx/entretenimiento/2012/02/16/buscan-cambiar-sistema-educativo-mexico

Santillana Ecuador. (2011). Sistema uno. *Santiallana Ecuador: Lineas de negocio website*. Retrieved from http://www.santillana.com.ec/index.php/quienes-somos/lineas-de-negocio?id=37.

37. Somalia Interactive Radio Instruction Project (SIRIP)

1. **Country/Region(s):** Somalia (South Central Zone, Somaliland and Puntland)
2. **Project owner/partner(s):** Education Development Center (EDC), Inc. and multiple local counterparts through grant mechanism
3. **Main purpose of the project:** Support teachers in providing primary-level instructional content to learners through the use of audio programs and supplementary resources
4. **Technology**
    a. **Device(s):** Radio, digital media players
    b. **Infrastructure/platform:** Radio reception, electricity and/or batteries
5. **Project sample/diversity:** The program impacted 330,000 in-school and out-of-school learners in the regions of South Central Zone, Puntland, and Somaliland. Two hundred and forty five new educational centers were created and supported by communities through the program in 2009 alone. Approximately 9,500 teachers were trained on universal teaching competencies, which were reinforced by Interactive Radio Instruction (IRI) programs (EDC, 2011, p. 1).
6. **Background/Focal area(s) of intervention:** The Somali Interactive Radio Instruction Program (SIRIP) was designed to provide high-quality interactive audio programs to Somali children attending formal, non-governmental, Quranic and community schools (EDC, 2011). Radio programs covering reading, math and life skills (*e.g.* health, conflict prevention and mediation) were broadcast daily or supplied on digital media players to students and teachers. Each station broadcasted SIRIP programs for three hours a day, up to five days a week (EDC, 2011, p. 3). In addition to broadcasting educational radio programs, SIRIP implemented a number of activities through a network of on-the-ground partners who trained teachers to use interactive teaching methods, distribute materials, monitored teaching and learning in the classroom, and collected data about the intervention (EDC, 2011, p. 3).
7. **Gender/Disability factors:** Gender-specific content was incorporated into the audio programs as well as reader series that feature girls and women in untraditional roles within Somali culture (professionals, athletes, etc.)
8. **Content**
    a. **Type of content/materials covered:** In addition to providing basic reading and math content in Somali, the IRI programs and reader series contained life skills content such as health, conflict prevention and mediation, and gender awareness
    b. **Content production:** Produced locally and in collaboration with Somali regional counterparts and EDC curriculum development experts
    c. **Ownership:** Proprietary
9. **Evaluation:** The grade one IRI evaluation was conducted in 2006/2007 by EDC. The grade one treatment group scored 15 percent higher in literacy and 20 percent higher in math than non-treatment peers (Letshabo, Kariuki & Yasin, 2007). A mid-term evaluation was conducted in 2010 by JBS International. Older learners returning to school after experiencing disruptions in their learning due to internal conflict and political instability showed learning gains of 21 percent compared to 8 percent for non-treatment peers (JBS International, 2010). Based on 32 classroom observations, the study concluded that "most teachers in formal primary schools and Learning Centers are able to manage SIRIP classes well when the programs are clearly audible, … and teachers find that students enjoy and engage with the SIRIP programs and learn from them at an

accelerated rate compared to similar students in years before SIRIP was available." (JBS International, 2010, p. ii).

10. **Project current status:** Project closed February 2012 after multiple extensions
11. **Other/Additional information:** Final report completed in February 2012; the report was not available through the EDC or USAID website at the time of review

12. Sources:

Project website: http://idd.edc.org/projects/somali-interactive-radio-instruction-program-sirip

JBS International. (2010). Somalia Interactive Radio Instruction Project (SIRIP): Mid-term evaluation. *USAID.* Retrieved from http://www.gem2.org/node/93.

EDC. (2011). Somali interactive radio instruction project. *EDC's International Development Division.* Retrieved from http://idd.edc.org/sites/idd.edc.org/files/Somalia%20SIRIP%20EDC_print.pdf

Letshabo, K., Kariuki, S., & Yasin, S. (2007). Somali Interactive Radio Instruction Program (SIRIP): Grade 1 evaluation. *EDC's International Development Division.* Retrieved from http://idd.edc.org/sites/idd.edc.org/files/siripgrade1evaluationreport2007final2.pdf

38. Stanford Mobile Inquiry-Based Learning Environment (SMILE)

1. **Country/Region(s):** U.S., India and Argentina
2. **Project owner/partner(s):** Seeds of Empowerment, Stanford Graduate School of Education, Programmable Open Mobile Internet (POMI)
3. **Main purpose of the project:** Emphasize the importance of student-generated questions and inquiry-based pedagogy as an integral part of the learning process through the Stanford Mobile Inquiry-Based Learning Environment (SMILE) mobile-based learning platform
4. **Technology**
    a. **Device(s):** Smartphone; Computer for Internet-based instruction/discussion platform with network communication of data generated from the smartphones
    b. **Infrastructure/platform:** Electricity; Internet connectivity (all users must be connected to the same server); SMILE is composed of both a teacher and student application (the teacher application is Java-based and is used to manage all SMILE activities in the classroom) (Stanford Graduate School of Education, 2012)
5. **Project sample/diversity:** International data unknown; a pilot test was conducted with 32 4th and 5th grade students (16 female participants comprising 50 percent of the total participants) at a public school in California; the class was composed of 14 high-achieving 4th grade students and 18 5th grade students (Seol, Sharp & Kim, 2011)
6. **Background/Focal area(s) of intervention:** SMILE is an assessment/inquiry maker, which enables students to quickly pose multimedia-rich, multiple-choice questions, and share them with peers using mobile phones during class. After the questions have been created, students can respond to and rate the questions that they and their peers created moments before. Finally, when all students have responded to each other's questions, teachers can view detailed personal and question-related data including which students answered the most questions accurately and which students created the highest-rated question. To facilitate this learning environment, SMILE includes an activity management application for the instructor that allows him or her to control the progress of the activity in real-time and to view all student data (Stanford Graduate School of Education, 2012). Seeds of Empowerment works with educators in local communities to support and train them to use SMILE and mobile education applications in their classes (Seeds of Empowerment, n.d.).
7. **Gender/Disability factors:** Unknown
8. **Content**
    a. **Type of content/materials covered:** Content covers a variety of primary-level subjects and is developed in local languages though no specific examples were provided at the time of review
    b. **Content production:** Seeds of Empowerment produced the content in collaboration with education experts from Stanford Graduate School of Education
    c. **Ownership:** Proprietary
9. **Evaluation:** No systematic evaluation of learning outcomes has been published. However, preliminary findings from a pilot study in the U.S. indicated that students were "very satisfied" with SMILE. Through open-ended questions, students specified that they enjoyed the opportunity to create their own questions and share them with peers (Seol et al., 2011, p. 5).

10. Project current status: Ongoing; expanding to other areas
11. Other/Additional information: None
12. Sources:

Seeds of Empowerment project website: http://seedsofempowerment.org/what-we-do/smile.html

Stanford project website: http://gse-it.stanford.edu/research/project/smile

Smile Article and Survey Findings: http://gse-it.stanford.edu/sites/default/files/worldcomp11_SMILE.pdf

Additional Pilot Research: http://gse-it.stanford.edu/research/smile/pilot-studies

Seeds of Empowerment (n.d.). Stanford Mobile Inquiry-based Learning Environment: Integrating mobile technology and innovative learner-centered pedagogy. *Seeds of Empowerment*. Retrieved December 12, 2013 from http://seedsofempowerment.org/projects/smile/

Seol, S., Sharp, A., & Kim, P. (2011). Stanford mobile inquiry-based learning environment (SMILE): Using mobile phones to promote student inquires in the elementary classroom. Proceedings of the 2011 World Congress in Computer Science, Computer Engineering, and Applied Computing. Retrieved December 12, 2013 from https://gse-it.stanford.edu/sites/default/files/worldcomp11_SMILE.pdf

Stanford Graduate School of Education (2012). SMILE: Stanford mobile inquiry-based learning environment. *Stanford Graduate School of Education*. Retrieved from https://gse-it.stanford.edu/research/project/smile

39. Tangerine/TangerineClass (Beta version)

1. **Country/Region(s):** Global; as of June 2013, Tangerine had been deployed in 20 different countries, including Haiti, Indonesia, the Philippines, and Kenya
2. **Project owner/partner(s):** RTI International
3. **Main purpose of the project:** Provide electronic data collection software designed for use on mobile computers used primarily to record data from Early Grade Reading Assessments (EGRA) and Early Grade Mathematics Assessments (EGMA)
4. **Technology**
    a. **Device(s):** Smartphones, tablets, eReaders
    b. **Infrastructure/platform:** Electricity and/or batteries, Internet connection or mobile phone network needed to connect to central database and to upload and download data
5. **Project sample/diversity:** Children in early grades (1-3) in developing countries; early pilots first conducted in Kenya, but the use of Tangerine has been diffused throughout the network of RTI International countries
6. **Background/Focal area(s) of intervention:** Tangerine uses open-source data collection software on mobile devices (tablets, phones, etc.) to record student responses to the EGRA and EGMA, and to produce the questionnaires for collecting data from students, teachers, and principals. Synchronization of data across a broad range of devices can enable rapid and efficient large-scale assessments (RTI International, 2012). Tangerine:Class is designed to provide teachers with a mobile-based tool capable of individually assessing and analyzing their students' literacy skills (RTI International, n.d.a). The Tangerine applications run in a browser, where assessment modules can be selected and customized using a test development wizard built into the application, making it possible for non-technical users to adapt test items as needed for their specific language, script, and data collection focus.
7. **Gender/Disability factors:** Tangerine:Class allows for the ability to monitor and track gender differences in assessments; training will be designed to be sensitive to the needs of female teachers, as some studies have indicated that women may be less familiar with this type of technology, and would therefore require specialized training (RTI Internaitonal, n.d.b)
8. **Content**
    a. **Type of content/materials covered:** EGRA or EGMA for large-scale analysis (Tangerine) or classroom-based assessments (Tangerine:Class)
    b. **Content production:** Tangerine was created by RTI International; survey content is produced by survey creators and participants and is then entered into Tangerine
    c. **Ownership:** Proprietary; Tangerine was developed specifically for trademarked products; source code is available
9. **Evaluation:** Field trial sample included 200 students across 10 schools in Kenya (English and Kiswahili speaking) to test the functionality and usability of EGRA and EGMA assessments, as well as compare paper vs. electronic forms; results highlighted the benefit of tablet vs. notebook administration of assessments, the cost benefit of electronic vs. paper administration and the workflow benefits (RTI, 2012).
10. **Project current status:** Ongoing
11. **Other/Additional information:** None

12. Sources:

Project website: http://www.tangerinecentral.org/

Pouezevara, S., & Strigel, C. (2011). Using information and communication technologies to support EGRA. In Gove, A. & Wetterberg, A. (Eds.), *The early grade reading assessment: Applications and interventions to improve basic literacy* (p. 183-226). Research Triangle Park, NC: RTI Press.

RTI International. (2012, January). Kenya field trial report: Summary. *Tangerine – Electronic data collection tool for early reading and math assessments*. Retrieved from http://www.rti.org/files/Tangerine_report_0112.pdf

RTI International. (n.d.a). Tangerine:Class. *Tangerine Central*. Retrieved from http://www.tangerinecentral.org/node/1020

RTI International. (n.d.b). Tangerine:Class Presentation at UNESCO Mobile Learning Week. *Tangerine Central.* Retrieved from http://www.tangerinecentral.org/node/1019

RTI International. (2013). *The primary math and reading (PRIMR) Initiative Kisumu ICT Trial -Teacher reference materials*. Washington, DC: RTI International.

Strigel, C. (2011, October). ICT and the Early Grade Reading Assessment: From Testing to Teaching. Educational Technology Debate: Exploring *ICT and learning in developing countries*. Retrieved from https://edutechdebate.org/reading-skills-in-primary-schools/ict-and-the-early-grade-reading-assessment-from-testing-to-teaching/

40. Total Reading Approach for Children (TRAC) project

1. **Country/Region(s):** Cambodia
2. **Project owner/partner(s):** World Education, Inc. (World Education Cambodia field office) in collaboration with Kampuchean Action for Primary Education and Cambodia's Ministry of Education, Youth and Sport (MoEYS), with support from All Children Reading: A Grand Challenge for Development
3. **Main purpose of the project:** Improve literacy levels of Cambodian students in grades one and two through the use of mobile learning games and teacher training
4. **Technology**
    a. **Device(s):** Smartphone, tablet
    b. **Infrastructure/platform:** Khmer language educational smartphone or tablet application developed in collaboration with Smart4Kids
5. **Project sample/diversity:** Total Reading Approach for Children (TRAC) is projected to benefit up to 2,000 children in the lower primary grades of Kampong Cham Province, with the potential for greater scale to reach additional provinces of Cambodia (World Education Cambodia, n.d.)
   Background/Focal area(s) of intervention: In response to low national literacy scores among grade-school children, the MoEYS shifted to a phonics-based approach to teach reading in 2011. Many teachers were unfamiliar with the new curriculum. As a result, World Education implemented the TRAC program to help schools and teachers successfully adjust to the new curriculum and promote early-grade reading. TRAC addresses reading both at school and at home, and has collaborated with the MoEYS to "develop short interval reading benchmarks in order to regularly assess students' progress in acquiring reading skills" and to help teachers identify struggling students and the areas in which they struggle (Douglas, 2013).

   In addition to training literacy coaches to work with teachers at each target school, World Education, in partnership with education software developer Smart4Kids, developed a Khmer language mobile learning application that directly links to the MoEYS textbook and benchmarks (Douglas, 2013).
6. **Gender/Disability factors:** Unknown
7. **Content**
    a. **Type of content/materials covered:** The mobile application uses stories and games (*e.g.,* phonics, sight words, supporting visuals, audio) to cover content that is addressed in the curricula for grades 1 and 2 and is aligned with the assessment benchmarks created by TRAC (Douglas, 2013); all app modules have been created and uploaded in Khmer
    b. **Content production:** World Education and the MoEYS provide the appropriate educational content through the app; Media One, a local NGO, provides illustrations and audio and Smart4Kids integrates content into the application
    c. **Ownership:** Unknown
8. **Evaluation:** The TRAC project has not been evaluated yet because it is in its initial stages.
9. **Project current status:** Ongoing
10. **Other/Additional information:** None

11. Sources:

Project website: http://cambodia.worlded.org/News/archive.htm

All Children Reading. (n.d.). *Innovation: Total Reading Approach for Children (TRAC).* Retrieved from http://allchildrenreading.org/total-reading-approach-children-trac

Douglas, J. (2013, May 21). "Total Reading Approach for Children Project: Improving early grade reading among Cambodian children." *GSMA Mobile for Employment Blog.* Retrieved from http://www.gsma.com/mobilefordevelopment/total-reading-approach-for-children-project-improving-early-grade-reading-among-cambodian-children.

World Education Cambodia. (n.d.). Total Reading Approach for Children (TRAC). *World Education Cambodia: Engage, Education, Inspire.* Retrieved from http://cambodia.worlded.org/Work/current_projects.htm#TRACproject

41. Using Mobile Phones to Accelerate Literacy Education and Empower Afghan Women

1. **Country/Region(s):** Afghanistan
2. **Project owner/partner(s):** Afghan Institute of Learning (AIL) in collaboration with Georgetown University, Creating Hope International and with support from the U.S. Department of State, UNESCO, and the United Nations Literacy Decade Fund (UNLD)
3. **Main purpose of the project:** Empower women and girls through mobile technology-based education, with a primary focus on improving literacy retention among newly literate populations
4. **Technology**
    a. **Device(s):** Mobile phones
    b. **Infrastructure/platform:** Feature phone with SMS capabilities, Internet, electricity, cable/WiFi
5. **Project sample/diversity:** The project worked with a sample of 50 female students between the ages of 14 and 32 in two educational centers (Yacoobi, 2013b)
6. **Background/Focal area(s) of intervention:** Launched in 2011, this project aims to empower women and girls through mobile technology-based learning. Its primary goal is to improve literacy and retention skills in neo-literate women and girls. Its secondary goal is to provide access to information regarding critical areas of life, such as civic and human rights, health and hygiene (including HIV and AIDS), nutrition, agriculture, and banking. The project also intends to develop programs that will enable the maintenance of literacy skills and motivation in marginalized populations, particularly among girls and women, and provide information for further learning and development.

    The pilot program was implemented by AIL between May 2011 and May 2012, and utilized mobile phone technology to promote basic literacy among women in rural Afghanistan by supplementing AIL's already successful classroom literacy sessions with instruction delivered via text messaging (UNESCO, n.d.). The fifty students selected to participate in the pilot each received a mobile phone, a SIM card, and a notebook. Teachers sent daily SMS messages to the students, who read the incoming message and responded via return text message to demonstrate reading comprehension and writing skills (UNESCO, n.d.).
7. **Gender/Disability factors:** Focus on adolescent girls and women
8. **Content**
    a. **Type of content/materials covered:** Unknown
    b. **Content production:** AIL staff developed the curriculum for texting using cell phones to encourage women and girls to read and write and to accelerate learning in literacy classes; AIL teacher trainers developed the curriculum for the texting class (Yacoobi, 2013a)
    c. **Ownership:** Unknown
9. **Evaluation:** The program was intended for students who were newly literate; however, pre-tests issued by AIL to program participants revealed that the majority of participating students were illiterate and unable even to recognize the letters of the alphabet (Yacoobi, 2013b). After completing the 5-month long mobile literacy class, "83 percent of students were able to test out of two levels of literacy courses—a feat which ordinarily would have taken 18 months" (Yacoobi, 2013a). A small number of students were also able to read and understand magazines and newspapers. These students sent out an average of 1,750 messages in four months (Yacoobi,

2013b). In addition to using the technology to complete their assignments, the program also allowed the students to socialize with each other beyond their usual scope (Yacoobi, 2013a).

10. **Project current status:** Ongoing
11. **Other/Additional information:** At the time of review, UNESCO indicated a plan to scale up this project
12. **Sources:**

Project website: Afghan Institute of learning. http://www.afghaninstituteoflearning.org/enrichment.html

UNESCO. (n.d.). Using Mobile Phones to Accelerate Literacy Education and Empower Afghan Women. *UNESCO ICT in Education*. Retrieved December 5, 2013 from http://www.unesco.org/new/en/unesco/themes/icts/m4ed/unesco-mobile-learning-week/speakers/sakena-yacoobi/

Yacoobi, S. (2013a). *Literacy and Networking for Afghan Women Through Texting*. The Huffington Post. Retrieved December 6, 2013 from http://www.huffingtonpost.com/afghan-institute-of-learning/literacy-and-networking-f_b_3383405.html

Yacoobi, S. (2013b). *Outline of Dr. Sakena Yacoobi's Speech to UNESCO Mobile Learning Week*. Retrieved December 6, 2013 from http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/ICT/pdf/Yacoobi.pdf

42. Ustad Mobile Literacy mLearning project

1. **Country/Region(s):** Afghanistan
2. **Project owner/partner(s):** Paiwastoon in partnership with the U.S. Department of State, USAID, and the Afghanistan Ministry of Education
3. **Main purpose of the project:** Improve reading comprehension and listening and numeracy learning
4. **Technology**
    a. **Device(s):** Feature phone
    b. **Infrastructure/platform:** Memory card, camera, Ustad application that runs offline on the simple feature phones available in small mobile shops and can be installed as a dictionary or any other simple app on any phone with a memory card
5. **Project sample/diversity:** The application is being used for adult women's literacy classes and Afghan National Army recruits; at the time of writing, the trial had reached 100 students (Mustafa, 2012)
6. **Background/Focal area(s) of intervention:** Ustad Mobile Literacy is a literacy-learning program developed for simple feature phones and offline use that provides literacy and mathematics courses aligned with the Afghan national curriculum. The lessons are primarily audio- or video-based, and available in both of the Afghan national languages, Dari and Pashto. "Ustad Mobile Literacy has been approved by the Ministry of Education and is now being used by literacy classes of adult women and Afghan National Army recruits in Kabul. It takes users from the first letter of the alphabet through grade 3 literacy and numeracy and includes hours of narrated instruction, reading comprehension exercise, quizzes, educational games, and video clips for visual learners" (Paiwastoon, 2013). The application contains built-in metrics, which enable a user's learning time and quiz scores to be reported over Bluetooth to his or her teacher's phone. An additional basic monthly data package (approximately $5 USD per month), allows a teacher's phone to transmit statistics from remote project sites to a secure online database, enabling real-time monitoring of education and training projects (Paiwastoon, 2013).
7. **Gender/Disability factors:** Special attention to women's education
8. **Content**
    a. **Type of content/materials covered:** National literacy curriculum in both Dari and Pashto; content has been approved by the Afghan Ministry of Education. Ustad Mobil is designed to be used in a classroom setting. Lesson one, for example, shows a graphic of the first letter of the alphabet — *alif*. A man's voice sounds out the letter, then uses it in a series of words. Finally, there is a short video of a man writing the letter on a whiteboard.
    b. **Content production:** Local content which is approved by the Afghanistan Ministry of Education
    c. **Ownership:** Unknown; the app is free (Momin, 2012)
9. **Evaluation:** According to the project website, Ustad Mobil was implemented in two centers involving 25 to 26 students in each mobile literacy class at the two learning centers. The results are unknown at time of review.
10. **Project current status:** Ongoing

11. **Other/Additional information:** According to Mustafa (2012), Afghan girls may use the phone for communication as well as for learning to read
12. **Sources:**

Project website: http://svr1.paiwastoon.net/mliteracy/

Momin, M. (2012). The ABC gets mobile. *Afghanistan Today*. Retrieved from http://www.afghanistan-today.org/article/?id=268

Mustafa, N. (2012). For Afghan women. Bright screens and uncertain futures in mobile learning efforts. *TechPresident.com* Retrieved from http://techpresident.com/news/wegov/23248/mobile-app-illiterate-afghan-women-ignores-cultural-barriers.

Paiwastoon. (2013). Adult literacy mLearning on simple mobile phones. *Mobiles for Literacy.* Retrieved from http://svr1.paiwastoon.net/mliteracy/.

43. Worldreader

1. **Country/Region(s):** Ghana, Kenya, Malawi, Rwanda, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe
2. **Project owners/partner(s):** Worldreader in collaboration with UNESCO, Amazon, Random House, and biNu, and support from All Children Reading: A Grand Challenge for Development (ACR – GCD)
3. **Main purpose of project:** Increase literacy rates around the world through the distribution of digital books on e-readers and mobile phones
4. **Technology**
    a. **Device:** Tablet, e-reader, feature mobile phones that support biNu[112]
    b. **Infrastructure/platform:** Electricity and/or battery, biNu data compression
5. **Project sample/diversity:** Worldreader has delivered over 721,129 digital books (figure current as of October 2013) to 12,381 students and teachers in nine African countries via e-readers (Worldreader, 2014c); Worldreader Mobile is on 4.5 million phones, mostly in Asia and Africa (Worldreader, 2014b)
6. **Background/Focal area(s) of intervention:** Worldreader deploys e-readers to students and teachers in sub-Saharan Africa to increase students' access to print. Through the e-readers, users are able to access an extensive database of novels, short stories, and educational information that is locally relevant and in their local language. Worldreader works with sponsoring organizations to reduce e-reader and content costs. Building local capacity for technical support is also a priority in the project implementation; as a result, the project also trains local business to repair e-readers. Worldreader Mobile uses biNu's patented technology to deliver a smartphone-like experience to low-end feature phones and enables people around the world to access Worldreader. Worldreader mobile can display books in many languages and features a built-in dictionary as well as a translate tool (Worldreader, 2014b).
7. **Gender/disability factors:** Unknown; there was even distribution of males and females in the evaluation study

[112] biNu is an app that gives basic mobile feature phones fast, cheap and easy access to Internet services and apps (http://www.binu.com/).

8. **Content**
    a. **Type of content/materials covered:** The Worldreader database contains over 29,000 digital books from a variety of American, African, and other international publishers (Worldreader, 2014a). Worldreader Mobile contains thousands of books and short stories from around the world, as well as educational information on health issues (Worldreader, 2014b).
    b. **Content production:** Worldreader actively partners with African publishers to provide local content.
    c. **Ownership:** Proprietary
9. **Evaluation:** A study was conducted by a third party (ILC Africa) during the 2010/2011 school year in nine selected schools in Ghana on the use of e-readers. The study was conducted on "a purposive sample of 481 students in nine project-affected schools in the communities of Suhum District, Kade, and Adeiso" (Worldreader, 2012, p. 5). The study found an increased enthusiasm of students towards reading (judged by interviews, books accessed, attendance at voluntary events and case studies) as well as a boost in regular access to reading materials. There was an incremental increase in reading ability for primary level students for those with e-readers vs. those without, based on standardized test results (primary levels only; non-significant differences at junior and senior high levels). A cost/benefit analysis was conducted comparing e-reader vs. traditional paper textbook system over the course of four years of primary and junior high school. The outright cost of e-readers was only 8 to $11 more per student (assuming the breakage rate significantly improved) while benefits and access to books was "much greater" (Worldreader, 2012, p. 47). There were also weaknesses in the study design in the project report: the sample was not geographically representative of Ghanaian students; self-reported student reading logs may not have been reliable; and 40.5 percent of devices broke and needed to be replaced during the one school year trial study.
10. **Project current status:** Ongoing
11. **Other/Additional information:** None

12. Sources:

Project website: http://www.worldreader.org/ and http://www.worldreader.org/what-we-do/worldreader-mobile/worldreader-app-in-action/

Evaluation website: http://www.worldreader.org/uploads/Worldreader%20ILC%20USAID%20iREAD%20Final%20Report%20Jan-2012.pdf

Worldreader. (2012). iRead Ghana Study: Final Evaluation Report. Retrieved from http://www.worldreader.org/uploads/Worldreader%20ILC%20USAID%20iREAD%20Final%20Report%20Jan-2012.pdf

Worldreader. (2014a). It's all about books. *Worldreader: Books for All.* Retrieved from http://www.worldreader.org/our-books/.

Worldreader. (2014b). Mobile Phones as E-Readers. *Worldreader Mobile*. Retrieved from http://www.worldreader.org/what-we-do/worldreader-mobile/.

Worldreader. (2014c). Worldreader's Mission. *Worldreader: Books for All.* Retrieved from http://www.worldreader.org/what-we-do/.

44. Yoza Project (formerly m4Lit)

1. **Country/Region(s):** South Africa
2. **Project owner/partner(s):** Fontera, Clockwork Zoo, Shuttleworth Foundation, Praekelt Foundation
3. **Main purpose of the project:** Stimulate a culture of literacy among South African youth by using engaging stories infused with social media and opportunities to participate in the story development process
4. **Technology**
    a. **Device(s):** Mobile phone
    b. **Infrastructure/platform:** m-Novels and stories are available through Mxit, a free social networking app that can function on over 3,000 different types of feature phones (Mxit, n.d.); stories are also available online through Yoza's own story website (Yoza Project, n.d.)
5. **Project sample/diversity:** The project is designed for, and available to, South African youth. Content is open to any user of Mxit, but the pilot studies were conducted with isiXhosa speaking youth, the majority of which were urban (69 percent Guateng, 16 percent Western Cape), and female (54 percent female, 46 percent male). In a month-long pilot study, 7,200 unique teens reportedly logged onto the site, 2,000 of which made contributions to the site by posting comments (Vosloo, 2010).
6. **Background/Focal area(s) of intervention:** Launched in 2009 as m4Lit, the pilot project aimed to increase accessibility of engaging and relevant reading content for youth in South Africa, as a complement to printed text. The first m-novel, Kontax, was made available in English and isiXhosa and tapped into the widely used social media platform, Mxit. M4Lit demonstrated increased uptake of m-novels that allow youth the opportunity to interact with the text. "Teens could discuss the evolving plot, vote in polls, leave comments, and finally submit a written piece as part of a competition for story sequel ideas" (Yoza Project, n.d.). The Yoza project builds from the success of m4Lit with an expanding collection of stories and m-novels in a range of genres, including literature classics taught in schools (e.g. Shakespeare).
7. **Gender/Disability factors:** Sensitivity to gender and disabilities does not seem to be inherent in the design, but preliminary findings suggest that the program may help increase female readership; results from the pilot indicated that Kontax had more female subscribers (54 percent female, 46 percent male), in contrast to the general Mxit audience, which is 57 percent male (Vosloo, 2010)

8. **Content**
    a. **Type of content/materials covered:** Story genres include mystery, youth fiction, as well as classic fiction
    b. **Content production:** Original m-Novels (*e.g.,* Kontax) are written and translated by Yoza staff and consultants. Classic fiction content uses digital versions of previously published books. End users also are able to add content through discussion boards.
    c. **Ownership:** Open Source; owned by Shuttleworth Foundation, but published under Creative Commons license
9. **Evaluation:** No impact evaluation has been conducted at the time of writing. However, research was conducted to assess digital literacies and indigenous literacies. Statistics on the number of m-Novel readers, and comments are available on the Reports page of the project website (http://yozaproject.com/reports/). In the project's own tracking system, they note that over 63,000 users have added Kontax as a Mxit contact or, in other words, over 63,000 users have access to the m-Novels (Yoza Project, 2011).
10. **Project current status:** Ongoing
11. **Other/Additional information:** None
12. **Sources:**

Project website: http://yozaproject.com/about-the-project/

Project reports available at: http://yozaproject.com/reports/

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