Landscape Review: Mobiles for Youth Workforce Development

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Cover Photo: Millicent Achieng of the Map Kibera Trust demonstrates the use of a mobile GPS device to Mwanajuma Kea during a training session in Kenya

Photo credit: Linda Raftree, Plan International

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List of Acronyms

AMREF	African Medical and Research Foundation
App	Application
BBC	British Broadcasting Company
BISP	Benazir Income Support Program
BPO	Business Process Outsourcing
CV	Curriculum Vitae
CKW	Community Knowledge Worker
EDC	Education Development Center
FACET	Fostering Agricultural Competitiveness Employing Information and Communication Technologies
GSM	Global System for Mobile Communications
GSMA	Global System for Mobile Communications (GSM) Association
HP	Hewlett Packard
ICT	Information and Communication Technology
ICT4D	Information and Communication Technology for Development
IS	Impact Sourcing
IVR	Interactive Voice Response
IYF	International Youth Foundation
MOOCs	Massive Open Online Courses
MNO	Mobile Network Operator
MP3	MPEG-1 or MPEG-2 Audio Layer III
mYWD	Mobiles for Youth Workforce Development
NEET	Not Employed or in Education and Training
PC	Personal Computer
PSI	Population Services International
SD card	Secure Digital Card
SHOPS	Strengthening Health Outcomes through the Private Sector
SIM	Subscriber Identification Module
SMS	Short Messaging System
TASCHA	Technology and Social Change Group
TVET	Technical and Vocational Training and Education
UNESCO	United Nations Education, Scientific and Cultural Organization
USAID	United States Agency for International Development
USSD	Unstructured Supplementary Service Data
WFD	Workforce Development
YWD	Youth Workforce Development

Glossary

Blended learning: Education methods that integrate digital technologies as part of a wider approach that includes innovations in the way classes are structured and strong support and accompaniment from a trainer, teacher, mentor, or peers. These approaches often use a mix of channels for teaching and learning, including digital, face-to-face, and print.

Bring Your Own Device (BYOD): An approach in which people participate in mobile-enabled programming or activities using their own mobile tools.

Business Process Outsourcing (BPO) Companies: Businesses that provide administrative or financial services, such as call center and customer service activities or accounting and payroll services, for other companies.

Cognitive skills: The basic abilities used for thinking, studying, and learning, including literacy and numeracy.

Hard skills: The specific skills required to perform a particular job.

Infomediaries: "Information intermediaries" are people who play a role in helping interpret data, bridging digital gaps, and supporting people to access information.

Interactive Voice Response (IVR): Automated systems that allow callers to interact remotely via a menu of options by voice or by responding to questions using the keys on their mobile phone.

Flipped classroom: Students receive lectures by video outside of the classroom and use class time for group work and discussions.

Massive Open Online Course (MOOCs): Online or video-based courses that are available to the public.

Microwork or microtasking: Small digital tasks that can be completed in a few seconds by people without specialized skills. "Microtaskers" are paid small amounts of money for completing a task.

Mobile: Often used as shorthand for mobile technologies or mobile devices.

Mobile money: Using a mobile device to deposit or withdraw money from a bank account or to transfer money between bank accounts. This term may also refer to using a mobile device to make physical or virtual purchases.

Mobile technologies: This collective term for mobile devices used by the mEducation Alliance includes mobile phones, e-Readers, tablet computers, flash memory, micro/pico projectors, audio-visual devices, and other similar technologies.

Mobile web: Internet accessed via a mobile phone or other mobile device.

Mobiles for Youth Workforce Development (mYWD): mYWD programs with workforce development goals that work with youth using mobile technologies.

Mobiles for Youth Workforce Development Working Group: The Mobiles for Youth Workforce Development (mYWD) Working Group is an initiative of the mEducation Alliance in partnership with The MasterCard Foundation and USAID. The Working Group is a community of practice dedicated to exploring how mobile technologies can increase young peoples' access to employment and opportunities for developing their workforce skills.

Open Source Software: Computer software with accessible source code made available by the copyright holder. Through open-source licensing copyright holders grant others the right to study, change, and freely distribute their software. Often open source software is developed in a public, collaborative way. Open source software can be re-adapted from one project to another and is often recommended as a better, less duplicative way of working.

Point-of-Sale (POS) device: A tool that allows a person to conduct transactions using mobile money or a credit card.

Real-time data: Data that are produced and accessed simultaneously, or almost simultaneously.

Self-paced learning: In the mYWD context, the practice of users accessing relevant online content, finding topics of interest, and learning at their own pace.

Short code: An easy-to-remember number (three to six digits depending on country, such as "911" in the United States) that can be obtained from a mobile network operator.

SIM Card: A small chip with a unique serial number that fits into a mobile phone and carries information such as the international mobile subscriber identity (IMSI), security authentication and ciphering information, temporary information related to the local network, a list of the services to which the user has access, a personal identification number (PIN), and a personal unblocking code (PUK) for PIN unlocking.

Social Media: A series of Internet-based platforms (e.g., Facebook, Twitter, YouTube) that allow people to create and share their own content and interact with one another to share, discuss, and modify that content.

Soft skills: Abilities related to personality and behavior traits, such as self-esteem, critical thinking, reliability, and collaboration.

Youth: The definition of youth used by institutions and countries varies widely. The age range of 15–24 years is the primary focus of the current work, though a broader working definition often includes adolescents (ages 10–14) and young adults (ages 25–29) (USAID, 2012c). In some countries, the legal definition of youth starts at age 15 and extends up to 35 years of age (African Union, 2009).

Youth Workforce Development: A series of activities to help young people acquire knowledge and skills (beyond basic literacy and numeracy) and develop attitudes and behaviors that will aid them in: (a) finding meaningful jobs or establishing self-employment, and (b) staying employed and productive in a changing economy. Surrounding these activities are the policies, programs, and systems that respond to labor market demands in the formal and informal sectors.

Tables, charts, and boxes

Foreword

We are very pleased to share this important learning product. The field of mobile technology is growing rapidly and offers significant potential for enabling workforce development among young people. The documentation of existing efforts and the state of the evidence base in mobiles for youth workforce development is key to helping us understand future directions for investigation and investment.

The 21st Century has already delivered two significant "dividends:" youth and technology. Today's youth, ages 10–24, represent more than a quarter of the present world population. This *demographic dividend* offers youth the opportunity to contribute to economic, social, and political life in ways that lift countries out of poverty, ensure greater stability, and promote healthier societies. At the same time, technologies are spreading rapidly and inexorably across the entire world. This *digital dividend* is removing barriers of geography, limited infrastructure, and the costs of information access. By early 2014, there will be as many mobile-cellular subscriptions as there are people inhabiting the planet—7 billion.[1] Much of this growth is occurring in low-resource settings in developing countries.

This landscape review explores the nexus of these two global dividends and highlights the growing evidence of the powerful impact of weaving young people and mobile technologies into the fabric of international development efforts. USAID and The MasterCard Foundation are enormously excited by the potential synergies that are being unleashed by pairing these two dividends and advancing opportunities for youth and workforce development through skills development, entrepreneurship, micro-work, job matching, and mentorship.

This landscape review and the learning series workshops on mobiles and youth and workforce development that contributed to it, are the result of the decisions our two institutions made to "walk the talk" of the spirit and ambitions of the mEducation Alliance, an international consortium of organizations committed to exploring appropriate, scalable, and low-cost technologies for advancing international education objectives. We invite readers to learn more about the mEducation Alliance and to share in our common efforts to convene investors, practitioners, and researchers; to spread knowledge of the field; and to explore collaborative opportunities for the advancement of mEducation.

We hope this review, superbly authored by Linda Raftree, and benefiting from the significant and thoughtful contributions of researchers and practitioners from around the world, will be useful to you and serve the wider community as a timely point of departure for informed dialogue, subsequent research, and strategic and scalable investments.

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[1] http://www.itu.int/net/pressoffice/press_releases/2013/05.aspx

Photo: Linda Raftree, Plan International

Executive Summary

Youth comprise 17 percent of the world's population and 40 percent of the world's unemployed (International Labor Organization, 2012a). Many factors combine to make sustainable, decent employment an enormous challenge for youth all over the world: low levels of education and technical skills, slow job growth, lack of information about available jobs, and difficulties accessing financial capital to start small enterprises (USAID, 2012). Sustainable, decent employment is especially difficult for marginalized youth, including girls and women, youth with disabilities, and youth living in rural areas.

Access to and use of mobile technologies among youth worldwide is growing rapidly. This fact has created excitement about the potential of mobile devices to catalyze new approaches that address some of the constraints keeping youth from finding and sustaining decent employment. Mobile technologies such as basic mobile phones, feature phones, smart phones, tablets, eReaders, radio, portable media players, portable drives, secure digital (SD) cards, and micro projectors offer continually expanding ways to receive, generate, share, communicate, interact with, manage, measure, and visualize information.

There is an enormous amount of activity in the use of mobiles for youth workforce development (mYWD), from small-scale, market-based start-up applications to mobile innovation hubs for youth entrepreneurs. The purpose of this paper is to map out who is doing what and where, and, to the extent possible, to discuss evidence of success. The landscape review identified 80 initiatives, organizations, projects, products, and services, and approximately 275 publicly available documents describing efforts that

use mobiles to support mYWD. The review also involved key informant interviews with 30 experts and practitioners in various fields from ICT to workforce development.

One key finding of the review is that much of this mYWD activity is at only an initial stage and little rigorous research exists on its impact. The evidence base for youth workforce development programming in general is still being developed (JBS International, 2013) and evidence on the role and impact of mobiles in youth workforce development programs specifically is even less well established.

How are mobiles being used in youth workforce development?

Youth workforce development programs can be organized into five main categories: (a) youth workforce education and training, (b) demand-side programs and policies (e.g., employment subsidies), (c) job matching and placement services, (d) entrepreneurship and enterprise development, and (e) overcoming social constraints to employment (World Bank, 2010). Most programs and initiatives are in a pilot stage or in their first or second year of implementation, and in most cases their potential for sustainability and scale is still being worked out.

Workforce education and training

Youth are using mobiles to access relevant education and training content. Different types of mobile devices allow trainers to create more interesting interfaces and to update curricula and content more rapidly. In addition, mobiles are enabling real-time measurement of student efforts, progress, and results; the better tracking and timely adjustments to methodologies and approaches help improve program quality.

The literature review identified seven lessons learned related to workforce education and training:

1. Girls and women have less access to mobile devices and training opportunities.
2. Cost is a significant barrier to accessing mobile information and content for youth, especially for marginalized populations, such as rural youth and young women.
3. Youth with disabilities are often excluded from education and training programs, however ICTs and mobile offer a bridge of opportunity.
4. The quality of education techniques matters more than the mobile device used.
5. Blended learning approaches, where teachers use technology to actively engage learners, show better outcomes than device-only approaches.
6. While SMS may not be appropriate for teaching more complex hard and soft workforce skills, it has been effective in the short-term for literacy retention and some basic behavior reinforcement, such as encouraging hand washing.
7. Local adaptability and sustainability of mobile programs remain challenges due to several issues, such as the lack of translated and culturally relevant content.

Demand-side programs and policies

Knowledge and information economies are growing and could increase the demand for trained youth. New kinds of jobs for which youth may be especially well suited include microwork[2] and infomediary[3] work. Because many youth have a high level of interest in technology, they can pick up the skills needed for these roles quite easily.

[2] Microwork or microtasking refer to small digital tasks that can be completed in a few seconds by people without specialized skills. Microtaskers are paid small amounts of money for completing a task.

[3] "Infomediary" is a term that combines information and intermediary and is sometimes used to refer to people who help others who are not digitally literate to access, interpret, and interact with online or digital information.

Also in the realm of demand-side programs, some large-scale government youth workforce efforts use mobile money to provide small grants that support the development of new youth-led businesses. This influx of funding, made easily accessible through technology, creates an environment supportive of young entrepreneurs.

The literature review identified three lessons learned related to mobile and demand-side employment programs:

1. Mobile money can help facilitate cash transfers for wage and training subsidies.
2 Microwork has been paired with Impact Sourcing[4] to help create employment opportunities for disadvantaged youth that may lead to substantial income increases.
3. Microwork is an employment option for youth in contexts where earnings are competitive and where it is compatible with local skills and language. Care should be taken, however, to ensure that youth are not exploited since this type of work is not covered by labor laws.

Job matching and placement services

In many cases youth are unable to find work due to lack of information about available jobs or an inability to effectively communicate their skills to potential employers. Mobile job matching and placement connects youth to employers with job openings and connects employers to qualified youth. In fact, many online job services are now moving to mobile. Through mobile social networks, youth are also sharing advice and tips on job seeking, resume writing, and interviewing.

The literature review identified five lessons learned related to using mobile to provide youth employment services:

1. Job matching systems are beginning to grow in scale through increased country coverage, numbers of participating youth, and numbers of employers posting jobs.
2. Youth report saving time and money by using mobile job seeking and job matching applications instead of searching want ads in newspapers, going door-to-door, or waiting for an opportunity to appear.
3. Although mobile job matching appears to be useful, it may not work in every context; these programs work best in environments with relatively high levels of unemployment and a small informal economy.
4. Mobile social networks are playing a bigger role in job and career counseling and organizations may want to explore options such as Facebook.
5. Mobile job matching can be successful at placing youth in jobs when it is combined with skills training and where there is a labor market for youth.

Entrepreneurship and enterprise development

Mobile has provided the opportunity to develop many new youth entrepreneurs through access to training and information. In fact, young people are connecting with enterprise training and support opportunities through innovation hubs and labs.[5] They are also able to quickly access information on funding opportunities for small enterprises, farms, and other income generating activities. In addition, youth are using mobile devices to buy and sell directly to local and global markets, and to get business management support.

[4] Impact sourcing is an approach that encourages large-scale industries to source and train employees for certain administrative jobs from low-resource, marginalized communities.

[5] Innovation hubs and labs tend to be physical spaces with state of the art equipment and an Internet connection where innovators working in the technology sector, including mobile application developers, gather to collaborate and work together.

The literature review identified five lessons learned related to entrepreneurship and enterprise development:

1. Youth in one small-scale study saw innovation hubs as supportive, nurturing spaces to network, collaborate, and develop mobile applications. Research and practitioners highlight that in order for these spaces to help youth in the long-term, support must go beyond app development to include topics like soft skills and financial management.
2. Possibilities for mobiles in agriculture include helping youth access financial services, creating buying and selling platforms, and providing helplines for farmers.
3. While there is a great deal of research on how ICTs foster agricultural development, not much of this research focuses specifically on youth.
4. Mobile supports radio programming in the rural agriculture industry by making it more accurate, timely, and accessible to listeners.
5. Mentoring is a critical element in successful entrepreneurship and business development efforts, especially for girls and young women, who are seriously underrepresented in technology fields.

Programs that overcome social constraints to employment

A number of social constraints to employability still exist, especially for young women and youth with disabilities. Some youth workforce development programs address larger social and cultural barriers by helping to change attitudes and behaviors. These include awareness campaigns that encourage girls and young women to consider jobs in the technology sector or other non-traditional fields. Steps are also being taken to ensure more inclusive programming and targeted outreach to youth who are marginalized due to disability. Mobile devices are playing a role in supporting effective participation of excluded groups by enabling alternative and non-traditional mentoring, training, and work opportunities.

The literature review identified two lessons learned related to programs that overcome social constraints to employment:

1. Girls and young women need additional support to take advantage of mYWD opportunities because they face generally restrictive social and cultural norms and have less access to mobile and ICTs.
2. Technology training helps youth with disabilities feel more empowered to enter the labor market.

What can be done to move the mYWD field forward?

Discussion and agreement around an mYWD framework

The current landscape review could serve as a starting point for discussing a common framework that explains mYWD programming. Once a framework is developed, it could set the stage for the creation of measurement indicators to help establish how well the field is doing in overcoming the key constraints to youth employment.

Further development of the evidence base for mYWD

Given that mYWD programs are in their infancy, not enough is known about where, when, and why successful programs work and how to design more effective mYWD programs. While impact evaluation of mYWD programs may not be possible at this early stage, documentation is still critical to help guide the field. Better use of mobile devices for data gathering should be encouraged to promote both monitoring of efforts and user feedback on initiatives. It is essential that any data collected should be disaggregated by age and gender.

A better understanding of what scale means for mYWD

A better understanding is needed in four arenas: (a) how can mobile technology help existing youth workforce development programs achieve scale, (b) how can new mYWD programs consider scale and sustainability from the outset, (c) what are the best models for mYWD replication, and (d) what policies are needed to help mYWD projects reach scale?

A gender lens in programming and a priority focus on girls and young women

A focus on girls and young women is critical in view of their low participation in virtually every aspect of mWYD (mobile access, education and training enrollment and completion, employment, involvement in entrepreneurship and technology, recognition in the agriculture and small enterprise sectors, demand-side policy development and decision making).

A focus on including youth with disabilities

Youth with disabilities are among the populations facing the most discrimination in education, training, hiring practices, and social acceptance. Inclusive ICTs and assistive technologies should be further explored and developed. Both inclusive programming and targeted programs that reach out to youth with disabilities should be made a priority.

Knowledge sharing and collaboration

A strong and active effort for knowledge sharing and collaboration in mYWD will be important. Mapping existing research, programs, projects, solutions, and service providers on a new or existing portal would be helpful. The mYWD Working Group can play a key role in furthering the discussion around a framework for mYWD and the development of indicators. A community of practice and better knowledge sharing could help ensure that successes, failures, and good practices are discussed and lead to lessons learned.

Further research and exploration

A number of specific research questions are outlined throughout the review. In addition to these, research is needed on conditions, partnerships, and models for scaling up mYWD programs.

Photo: Linda Raftree, Plan International

I. Introduction

In recent years, attention in the development sector has shifted sharply towards two areas—youth and employment. While the increase in the 15–24 year old population in some countries offers an opportunity for catalyzing change and bringing in fresh ideas and new energy, many nations are grappling with the challenge of providing young people with meaningful work opportunities and are concerned about the growing number of youth who are disillusioned about their futures.

What does youth mean?
The definition of youth used by institutions and countries varies widely. The age range of 15–24 years is the primary focus of the current work, though a broader working definition often includes adolescents (ages 10–14) and young adults (ages 25–29) (USAID, 2012c). In some countries the legal definition of youth starts at age 15 and extends up to 35 years of age (African Union, 2009).

Almost 75 million youth between 15 and 24 years of age were unemployed in 2011, an increase of more than four million since 2007. Globally, the youth unemployment rate is nearly 13 percent and youth are nearly three times as likely as adults to be unemployed (International Labor Organization, 2012a). The number of youth not employed or in education or training in some countries is as high as 12.4 percent for young men and 28.1 percent for young women (USAID, 2012c).

Since the financial crisis began in 2008, informal and part-time work have been the most rapidly growing forms of employment. Youth are entering a labor market characterized by a lack of "decent work,"[6] rising vulnerable employment with low wages, and no job security (USAID, 2012c). Young women are even more likely to be unemployed than young men (Stavropoulou and Jones, 2013). In some countries few formal jobs are available. In others, there is a skills mismatch and young people do not have the qualifications to move into existing public and private sector jobs (Making Cents, 2011).

Youth Workforce Development (YWD)
Youth workforce development (YWD) refers to a series of activities that help young people to acquire knowledge and develop skills that go beyond basic literacy and numeracy, and which are part of the education, attitudes and behaviors that youth need to find meaningful jobs, establish self-employment, and stay employed and productive in a changing economy. Surrounding these activities are the policies, programs and systems that respond to labor market demands in the formal and informal sectors (USAID, n.d.).

Youth workforce development (YWD) programs address this situation by supporting youth to acquire knowledge and develop skills that help them find meaningful work, start small enterprises, and remain sustainably employed and productive. YWD programs also include the policies, programs, and systems that help create a favorable environment for youth employment and stimulate economic opportunities for youth.

The integration of mobile devices into youth workforce development programs—mYWD—is an exciting new development. Using mobile devices, youth are more easily accessing educational content and connecting with skills training and job opportunities. They are creating and marketing their own skills and products to a wider audience of potential employers and customers. Youth are using mobile devices to connect to markets and access information that is helping them strengthen their own enterprises. Via mobile, youth are overcoming some of the key employability constraints that prevent them from entering the labor market and becoming economically productive members of their societies.

Mobile Devices
The definition of mobile device used by the mEducation Alliance and in this paper is broadly described to include mobile phones, e-readers, tablet computers, flash memory, micro/pico projectors, audio-visual devices and other similar hand-held devices (mEducation Alliance, 2012).

Access to and use of mobile devices among youth worldwide is growing at a rapid pace (International Telecommunication Union, 2011). This trend is generating a great deal of enthusiasm about their potential for supporting youth workforce development opportunities such as education and training, career services, job matching, and entrepreneurship and enterprise development. There is also hope that training youth with information and communications technology (ICT) skills will help them contribute to a growing ICT sector and meet the demands of a more global and technology-oriented market (International Telecommunication Union, 2012a). The digital economy is expected to be in the range of $20.4 trillion in 2013 and both low- and high-income countries can benefit from preparing youth for digital employment (Jayaram, 2013).

[6] "Decent work" involves opportunities for work that is productive and delivers a fair income; provides security in the workplace and social protection for workers and their families. It also offers better prospects for personal development and encourages social integration; gives people the freedom to express their concerns, to organize and to participate in decisions that affect their lives; and guarantees equal opportunities and equal treatment for all (International Labor Organization, 2007).

In order to take full advantage of the potential that mobile offers for youth workforce development, a better understanding of the most basic facts is needed. What is involved in mYWD, and for whom, when, where, why, and how is it working? The mYWD field is young, however, and this kind of evidence base has not been built. Explicit support for experimentation, including pilot projects, systematic data collection, and rigorous data analysis is needed to develop an evidence base that can identify approaches with a strong impact that are potentially replicable and scalable with quality at a reasonable cost.[7] In the absence of a reliable evidence base that promotes generalizability, a next best alternative is to begin developing a knowledge base from pilot projects, data on user uptake of mobile products and solutions, findings from both successes and failures, and a review of available literature and evidence in mYWD and related areas. This type of documentation can help identify knowledge gaps and suggest areas for research, discussion, and action. The current landscape review aims to contribute to this knowledge base for mYWD.

Mobiles for Youth Workforce Development (mYWD)
Mobiles for Youth Workforce Development (mYWD) programs are those that work with youth, include mobile technologies and have workforce development goals.

Key Questions for mYWD

The current research explores the mYWD landscape in order to answer the following key questions:

- What organizations and programs are using mobiles to help overcome the barriers to employment, particularly for youth?
- What type of programming has been implemented and how?
- Where and why do prime opportunities exist for integrating mobile devices into youth workforce development programs?
- What are relevant considerations related to gender and disability in mYWD programming?
- What factors facilitate or hinder mYWD in specific contexts?
- Are there any research findings that show the impact of mobiles on youth workforce development?

Methodology

Through the partnership between the mEducation Alliance, The MasterCard Foundation and USAID, a mYWD Working Group was launched to explore ways that mobile technologies can increase access to employment for young people and provide them with opportunities to develop their workforce skills. The landscape review aims to inform the Working Group's future efforts and provide an overview of the field for people interested in mYWD.

This review identified more than 80 initiatives, organizations, projects, products, and services.[8] It also identified approximately 275 publicly available documents,[9] including evaluations, academic research, institutional reports, conference proceedings, project reports, and meta-studies published between 2001 and 2013.[10] The literature sample was compiled from (a) web searches of journals, blogs, articles, INGO and NGO website resource sections, and bibliography scanning; (b) partner organizations; and (c) personal recommendations.

[7] Key informant interview, Matthew Kam, American Institutes for Research, February 2013.
[8] See Annex 1 for a detailed list of projects and initiatives reviewed.
[9] See Annex 2 for descriptions of evaluations reviewed.
[10] See Annex 3 for descriptions of mYWD research documents.

Table 1: Key Projects and Documents Reviewed for the Landscape Study				
Workforce development area	Project Reports	Evaluation Studies	Research Papers	Other publications
Education and training	23	15	16	Over 200 mYWD-related documents that did not correspond to any one particular category (see Annex 1 for a detailed list)
Demand-side programs	6	2	2	
Employment services	7	2	1	
Entrepreneurship and enterprise development	35	4	8	
Overcoming social constraints	11	2	2	

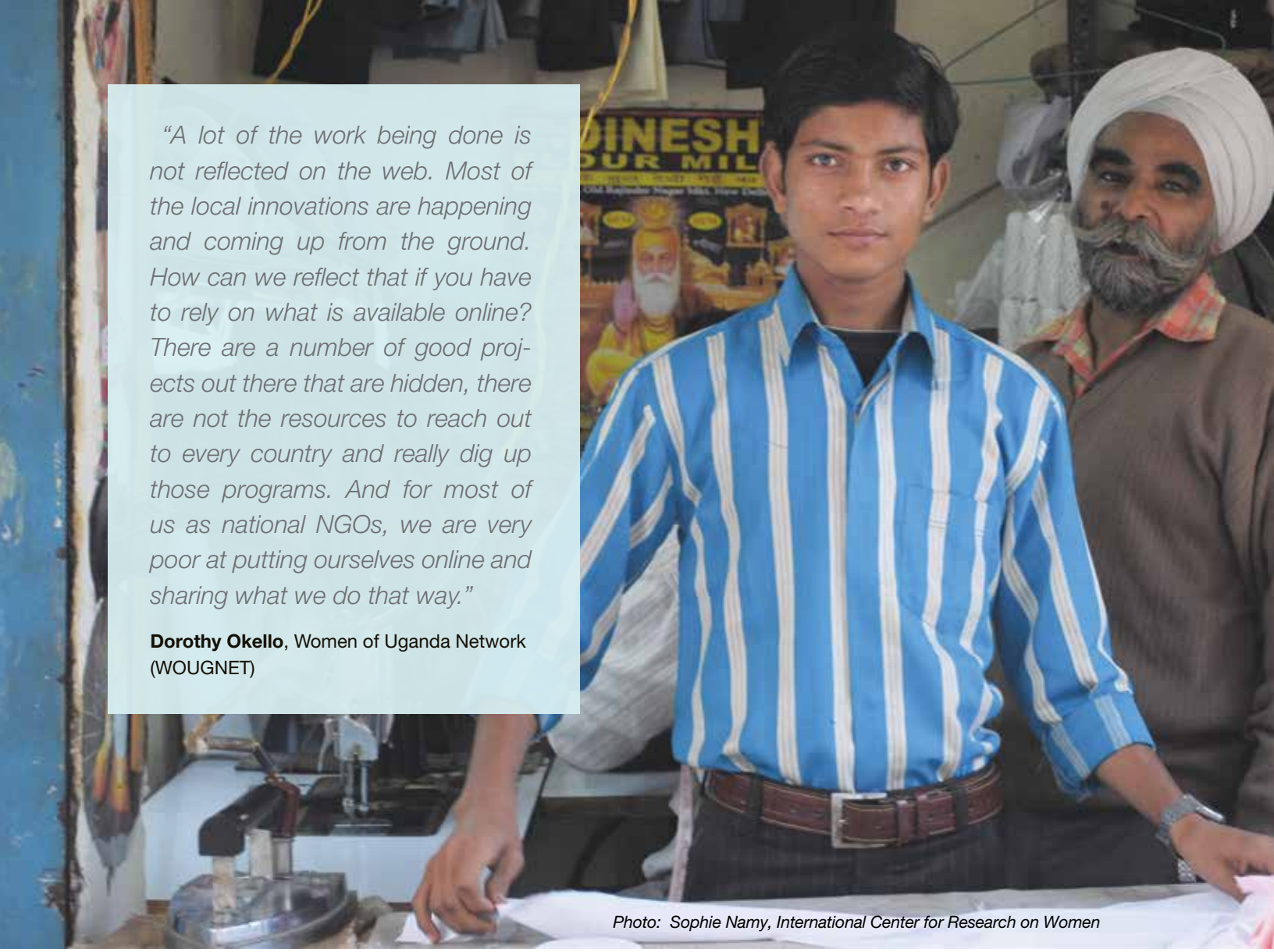
Due to the dearth of specific documentation on mobiles for youth workforce development and the fact that a variety of terms are used to describe relevant initiatives, a wide range of keywords was used to identify projects and other references: mobile phones, mobile technologies, information and communication technology (ICT), information and communication technology for development (ICT4D), employability, workforce development, youth employment, ICT training, education, youth skills building, jobs, livelihoods development, communication for development, gender, economic development, entrepreneurship, business skills training, agriculture, mobile money, mobile health, mobile finance, labor markets, innovations, sustainability, and scale.

Twitter, blogs, and email were used to reach out to academics, donors, and practitioners working in these areas for information, documentation, and examples of initiatives. Google Alerts were also established for key terms.

The mYWD Working Group
The Mobiles for Youth Workforce Development (mYWD) Working Group is an initiative of the mEducation Alliance in partnership with The MasterCard Foundation and USAID. It is a community of practice dedicated to exploring how mobile technologies can increase access to employment for young people and provide them with opportunities to develop their workforce skills.

Information collected at events, meetings, and conferences (e.g., the 2012 mEducation Symposium and the 2013 GSMA Mobile World Congress) was also used to conceptualize the current situation in mYWD. Key informant interviews were conducted with 30 experts and practitioners in the field of mYWD and related ICT and mobile fields.[11] Twenty responses to an online survey sent to mYWD Working Group members provided additional input.

[11] See Annex 4 for a list of key informants.



"A lot of the work being done is not reflected on the web. Most of the local innovations are happening and coming up from the ground. How can we reflect that if you have to rely on what is available online? There are a number of good projects out there that are hidden, there are not the resources to reach out to every country and really dig up those programs. And for most of us as national NGOs, we are very poor at putting ourselves online and sharing what we do that way."

Dorothy Okello, Women of Uganda Network (WOUGNET)

Photo: Sophie Namy, International Center for Research on Women

Limitations

Capturing the state of the field of mYWD in any comprehensive way is difficult. The term is being used to refer to an extremely wide range of programs and practices, including basic literacy and numeracy, hard and soft skills training, job matching, peer support networks, mentoring, entrepreneurship, agriculture, and the development of mobile applications. In addition, the term mobile technologies is used in a broad sense and the potential array of devices includes everything from basic mobile phones to tablets, portable drives, portable radios, micro projectors, and more.

The fact that mYWD is a nascent field is a limiting factor. It is likely that small-scale initiatives without a strong web presence and initiatives documented in languages other than English have not been identified for this landscape review. Also few impact evaluations exist for initiatives in their experimental and pilot stages, and few programs have reached a level of stability providing conditions for meaningful external evaluation.[12] For these reasons it was necessary to cast a wide net in order to find relevant information that could contribute to a better understanding of this emergent field.

[12] Matthew Kam, personal communication, February 2013.

II. Youth Workforce Development

Youth Workforce Development (YWD) programs include a range of activities that help young people overcome constraints to finding meaningful work through the acquisition of knowledge and development of skills that go beyond basic literacy and numeracy. These skills comprise the qualifications, attitudes, and behaviors that youth need to find meaningful jobs or establish self-employment, and stay employed and productive in a changing economy. Policies, programs, and systems that respond to labor market demands in the formal and informal sectors support these activities (USAID, n.d.).

The evidence base on what works in YWD is emerging but is not yet conclusive. A 2012 review of the literature found that most YWD programs include four main areas of programming: (a) workforce education and training, (b) demand-side policies and programs, (c) job matching and placement services, and (d) entrepreneurship and enterprise development (JBS International, 2013). These programs generally address five key constraints that limit youth access to employment (The World Bank, 2010):

- Job-relevant skills constraints: insufficient basic or entrepreneurial skills, mismatch of technical or behavioral skills;
- Lack of labor demand at both the macro level, because of slow job growth, and the micro level, because of employer discrimination;
- Job search constraints such as lack of information about job openings or inability to communicate skills to potential employers;
- Firm start-up constraints including lack of access to financial capital or business networks; and/or
- *Social constraints* on the supply side, such as social norms that limit skills development or labor market entry.

YWD programming normally addresses these constraints through strategic interventions and policies:

- Workforce education and training includes: basic education, technical and vocational education and training (TVET), job skills training, apprenticeships, and life skills training. Workforce training is not limited to technical training or classroom instruction.
- Employment services include on-going job referral services that bring employers and workers together through job postings, job fairs, job shadowing, job placement, resume preparation, and coaching.
- Entrepreneurship and enterprise development includes support programs for self-employment and business development, such as entrepreneurship training, mentoring, and financial services for loans and capital.
- Demand-side policies and programs include broad-based economic growth programs like national youth employment policies, value chain development, public works programs, wage subsidies, minimum wages, and tax breaks for employers (JBS International, 2013).
- Addressing social norms includes programs that support effective participation of excluded groups, non-traditional skills training, safe training and employment spaces for excluded youth, and broader awareness campaigns.

Youth are not a homogenous group and the constraints faced by individual youth or specific youth sub-groups vary. Disadvantaged youth face particularly high barriers. Gender discrimination and discrimination against youth with disabilities are major issues impacting workforce development outcomes.

III. Mobile Technology

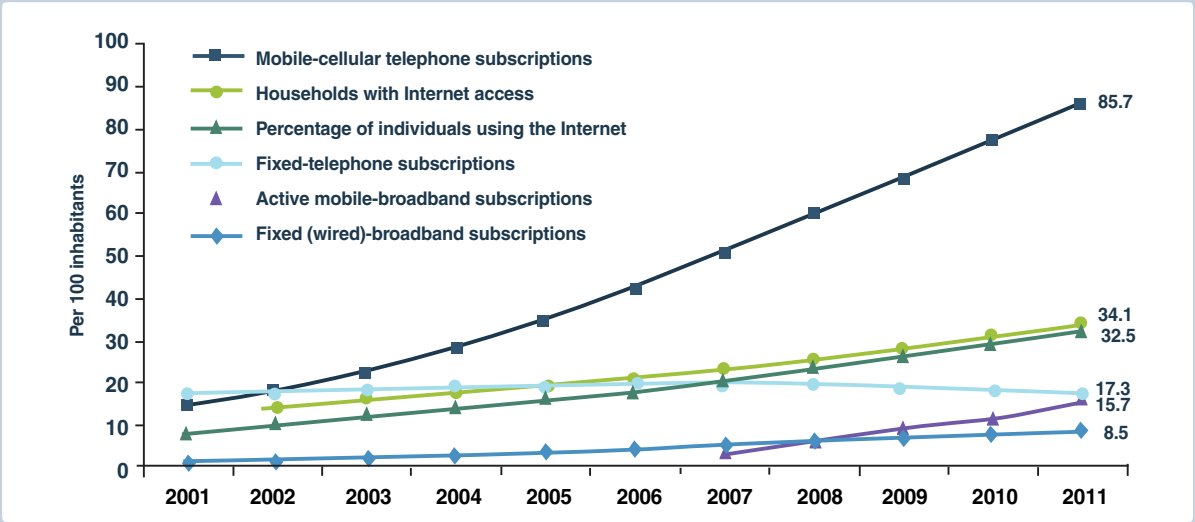
Mobile devices such as basic mobile phones, feature phones, smart phones, tablets, eReaders, radios, portable media players, portable drives, secure digital (SD) cards and micro projectors offer ever-expanding ways to receive, access, generate, share, communicate, interact with, manage, measure, and visualize information (see Box 2). They are generating a range of new possibilities in development work, including YWD programming.


Photo: Paul Kim, SMILE

The growth in access and use of mobile devices has generated a burst of excitement about their potential to reach previously unreachable people at scale and to spur the development of new approaches that address poverty and improve the lives of people in developing countries.

At the same time, access and use of ICTs among disadvantaged groups and populations, especially the poor, rural populations, girls and young women, and people with disabilities are still limited in many contexts. In order to successfully integrate mobile technologies into development programs it is important to understand which devices are available and affordable to whom and to keep abreast of advances in technology that may extend their accessibility.

Chart 1: Global ICT developments, 2001–2011



Source: ITU World Telecommunication/ICT Indicators database.

It is also necessary to acknowledge cultural, educational, and resource-related barriers that affect use among different populations.

SIM Card
A small chip with a unique serial number that fits into a mobile phone and carries information such as the international mobile subscriber identity (IMSI), security authentication and ciphering information, temporary information related to the local network, a list of the services to which the user has access, a personal identification number (PIN) and a personal unblocking code (PUK) for PIN unlocking.

A nuanced understanding of mobile use at both the macro and micro levels is critical, especially when working with marginalized people who are often members of the target populations for aid and development programming. For example, high mobile phone ownership statistics at the macro level may not accurately reflect the number of people who actually have a phone because an individual may possess multiple SIM cards or more than one device (GSMA Association, 2011). In addition, while household level access is often used to indicate overall access, a household may own a phone, but it may not be available to all the members of the family (Lee & Bellemare, 2012). A similar issue has been noted with radios, which are theoretically available to the whole family but whose use is often controlled or restricted by the male head of household.

Box 1: biNu Reduces the Cost of Data

biNu, an application platform with over 4 million users in December 2012, runs on a wide range of mass-market mobile feature phones. biNu's technology allows Java, Android and Blackberry phones with an Internet connection to access web-based apps and Internet services (for example, Facebook, Google, Twitter, YouTube as well as books, health information, news, sports and weather). The application is free to download via WAP or SMS, however data charges are still incurred for data access. biNu's technology allows for faster data processing (in the cloud vs. on the handset itself) and better data compression capabilities than standard mobile browsers. This technology uses less data bandwidth, in turn reducing data transmission costs to the user.

Though mobile Internet subscriber numbers are growing, most of the world continues to use low-end mobile devices with limited features and functions. In addition, there are large differences in access within and among countries, including disparities between urban and rural areas, rich and poor, and males and females. For example, despite a rise in mobile penetration, some rural areas still have only half the mobile penetration of urban areas (GSMA Mobile and Development Intelligence, 2013). While Internet access via mobile phone is increasing, it remains largely out of reach of the poor. For this reason, some predict that commercial and public facilities will continue to be essential to Internet access in developing countries and rural areas (International Telecommunication Union, 2011).

Social networks and social media have become a primary means of accessing the Internet for youth throughout the developing world. In some African countries, 70 percent of youth who access the Internet do so through mobile devices, and much of their Internet use is channeled through Facebook and other social media sites. In some countries Google offers free Internet access for Google Search, Gmail and Google+, and only charges users for additional browsing. Both Facebook Zero and Wikipedia Zero allow free mobile Internet access to their sites. By collaborating with mobile carriers, Facebook and Wikimedia have enabled access without data usage charges. As a result, the Internet is being accessed through mobile social media, making Facebook and Wikipedia pages a potentially important way to reach out to youth in developing countries.

Photo: Matt French, JBS International

Alongside social media, new technologies that help increase access and lower costs for data are in constant development. biNu (see Box 1) allows users to access mobile web content more quickly by reducing processing and data transmission time for feature phones. This leads to a reduction in data usage charges. Nokia Life Tools make a "dumb" phone behave more like a "smart" phone with a richer user experience by enabling basic handsets to transmit a graphical user interface over SMS and providing app-like features such as weather and news.

Close monitoring of the rapidly changing mobile technology landscape combined with thorough analysis of the local context can allow development workers to take better advantage of new ways to reach and connect with target populations at greater scale while still ensuring the inclusion of marginalized groups.

Box 2: Global Access to Mobile Devices

Mobile devices and their availability in developing countries

The potential of mobile to impact development programming depends greatly on how accessible devices are to target populations, especially given that the more sustainable program approaches often rely on the "bring your own device" (BYOD) concept in order to be more sustainable.[13] This means that program beneficiaries participate using the devices they already own (Clifford, 2013).

Basic mobile phones

Basic mobile phones characteristically support little functionality besides voice calls and text messaging. The simplest mobile phone—sometimes called a "dumb" phone—is now the most widely available and owned communication device in the developing world. Between 2010 and 2011, the number of mobile-cellular subscriptions for basic mobile phones increased by more than 600 million to a total of around 6 billion, almost all in the developing world. Mobile-cellular penetration increased by 11 percent worldwide. At the end of 2011, an estimated 86 out of every 100 people had a mobile subscription (International Telecommunication Union, 2012b).

Feature phones

Feature phones are the most inexpensive cellphones that are capable of hosting and running third-party mobile application software. Feature phones may or may not come with data plans, although they normally support WAP and GPRS data plans. As technology advances, the difference between a feature phone and a smart phone is blurring. Some predict that in 2013, the sale of smart phones globally will be outpace that of feature phones (Reardon, 2013).

Smart phones

Smartphones offer faster processing power, networking support, larger screens, higher screen resolution, and support for touch screens and virtual keyboards. Smart phones give users greater ability to produce and consume multi-media. Higher end feature phones and lower end smartphones are converging in both price and functionality, and mobile network operators and Internet service providers are working hard to bring data access to lower income segments of the population through hybrid data plans or zero-cost mobile Internet browsing (GSMA Mobile and Development Intelligence, 2013). In 2012, some 10 percent of people owned smart phones in the developing world, compared to 1 percent in 2007, and growth is expected to continue over the next 5 years. Because countries and communities vary significantly in terms of smart phone ownership, however, not all countries will have widespread smart phone usage in the very near future.

Tablets and e-Readers

Over 14 million tablets were sold in 2011 and sales are expected to be close to 300 million in 2015. Given their tremendous growth in their popularity, it is predicted that Internet connectivity in the future will be primarily through tablets and smartphones (GSMA Mobile and Development Intelligence, 2013). Tablets function like laptop computers, netbooks, or larger-sized smartphones. While e-Readers may look like tablets, they function like digital books and tend to be used exclusively for reading, allowing users to access but not to create content (Burns, 2011).

[13] Key Informant Interview, John Traxler, August 2012.

Radio

Globally, the proportion of households with a radio exceeds 75 percent in most developing countries (International Telecommunication Union, 2012c). Some mobile handsets can receive domestic analog radio broadcasts and people commonly listen to the radio via their mobile phones (International Telecommunication Union, 2010). Radio is the most widely used channel for disseminating information to rural audiences across Africa. The combination of radio and low-cost, modern ICTs, including mobile phones, multifunction MP3 recorders, and interactive voice response (IVR), can dramatically increase the capacity of radio to engage rural populations, including those without electricity or who cannot read or write (Sullivan, 2011).

Portable media players

Portable media players (also called MP3 and MP4 players) are small, portable audio players that can record and play back music or other audio. Mobile phones can also serve this function. There is no easily available data on the use of portable media players.

Portable drives

Data storage on secure digital (SD) cards and portable drives (also known as thumb drives, flash pen drives, USB drives, external hard drives, or zip drives) allow content to be transported, accessed, and shared from one computer to another. Storage capacity is constantly on the rise, and it is now common to find flash drives that can store one or two gigabytes of information. Portable drives are especially useful where Internet connectivity is slow or nonexistent. Media, curricula, encyclopedias, maps, and other data can be stored and transported for offline use. DVDs and CD-ROMs are also used in this way. Reliable data on access and use of these media does not exist.

Micro projectors

Often called “pico projectors,” these devices connect directly to a mobile phone so that photos or videos can be projected rather than displayed on the phone’s small screen. Micro projectors can also be pre-loaded with content from an SD card or portable drive. Micro projector sales were predicted to increase 60-fold by 2013 globally (Mcgrath, 2009), yet the real market for micro projectors may be the developing world, given that the projectors help overcome barriers like electricity and connectivity. Availability of micro projectors and related accessories on the African continent, for example, continues to be a challenge; only a few providers supply them at a high cost in South Africa and Nairobi, Kenya.[14]

[14]Josh Woodard, personal communication, March 2013. Woodard is the manager of the USAID FACET project that has helped local implementers use low-cost video projectors to reach smallholder farmers. According to Woodard, larger orders of pico projectors (50 or more) can be procured directly from China, while smaller orders are normally brought in from the US by program partners.

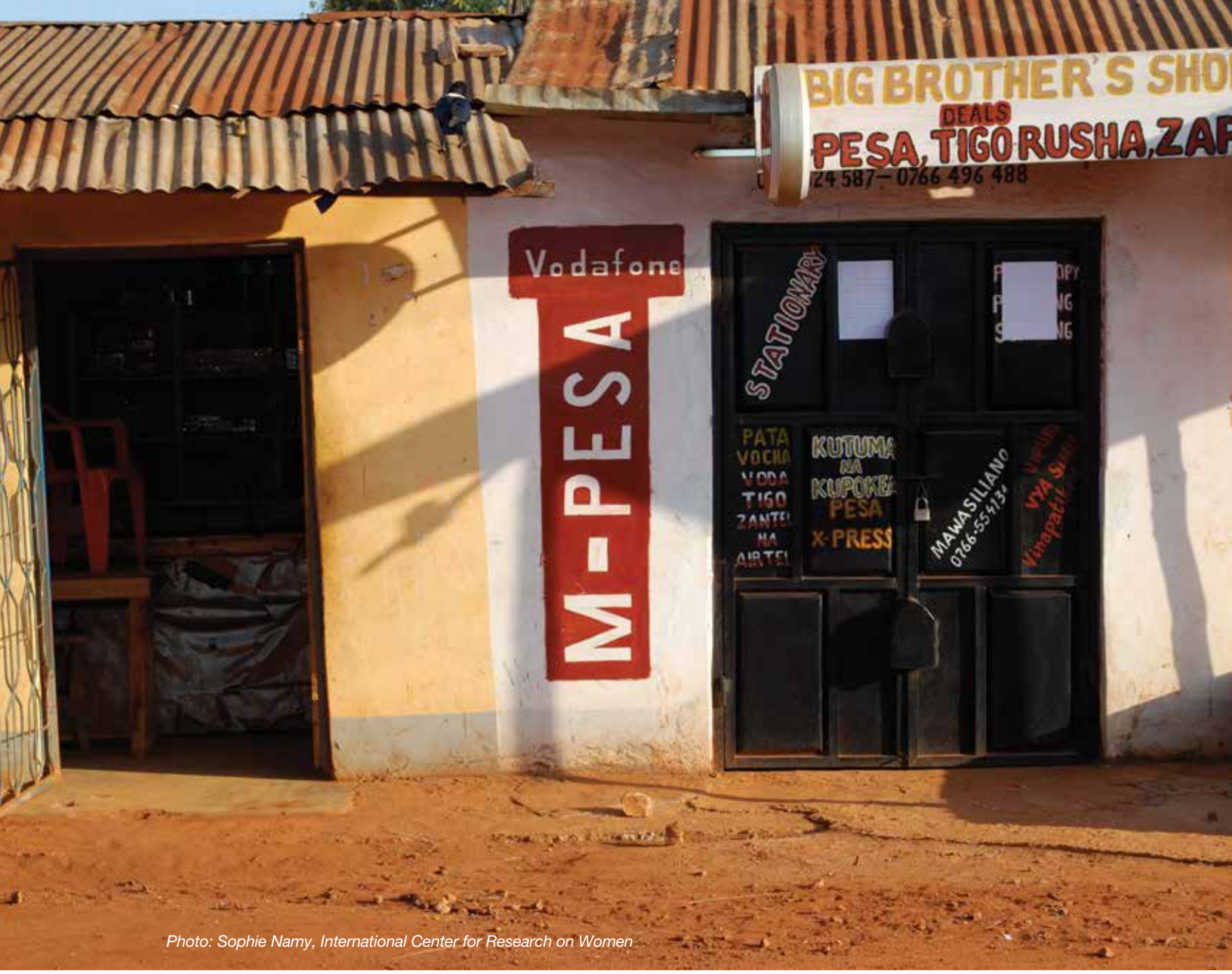


Photo: Sophie Namy, International Center for Research on Women

IV. Mobiles For Youth Workforce Development

Globally, youth face multiple constraints to employability and YWD programs aim to help them overcome these constraints through targeted programs. Incorporating mobile devices into these programs is opening up new ways for young people to prepare for work and improve their employment prospects. Development organizations, governments, and the private sector are also experimenting with new approaches and tools to expand and improve their programs.

The use of mobile devices in workforce education and training programs, for example, is helping youth gain new job-relevant skills. Youth are using mobile to discover and access relevant education and training content. Staff, teachers, and trainers are using different types of mobile devices to access

and create more interesting and updated curricula and content. In addition, mobiles are enabling real-time measurement of student efforts, progress, and results, allowing for better tracking and timely adjustments to methodologies and approaches for improving program quality.

Microwork (also called microtasking) refers to small digital tasks that can be completed in a few seconds by people without specialized skills. Microtaskers are paid small amounts of money for completing each task.

The growing mobile industry in some countries is creating a demand for information and knowledge-based jobs and new kinds of jobs for which youth may be especially well suited are arising in this expanding information economy, including microwork and infomediary jobs. Some large-scale government programs use mobile money to provide subsidies for vocational training and small business grants; mobiles are being used to support easier management, tracking, and cost-effective distribution of these subsidies. Mobile devices are also being used to collect user feedback and real-time data about program quality.

Infomediaries are information "intermediaries" who support communities to access, interpret, share and produce information using new technology tools.

Real-time data refers to data that are produced and accessed simultaneously, or almost simultaneously.

In many cases youth are unable to find work due to a lack of information about available jobs and an inability to communicate their skills and availability to potential employers. Youth and employers are connecting with one another through mobile job matching-job seeking services. Youth use mobile devices to discover and access employment services, jobs, internships, and other workforce development opportunities. They share advice and tips on job seeking and interviewing through mobile social networks.

Young people are also connecting with entrepreneurship and enterprise training and support opportunities through mobile. The ability to quickly access information through mobile devices is helping youth start up and develop small enterprises, informal job activities, and agricultural work. The mobile industry, related side industries, and innovation hubs are opening up ways for youth to overcome firm start-up constraints by providing opportunities to acquire tools, skills, and funding for small enterprises. Youth are using mobile devices to buy and sell directly to local and global markets. Mobile applications that support business management can help them run small enterprises more effectively.

Real-time data refers to data that are produced and accessed simultaneously, or almost simultaneously.

A number of social constraints to employability still exist, especially for young women and youth living with disabilities. Some programs are aimed at addressing larger social and cultural barriers by helping to change attitudes and behaviors. Awareness campaigns that encourage girls and young women to consider jobs in the technology sector are working to change the negative attitudes about girls' capacities and aptitudes in non-traditional fields. Steps are also being taken to ensure more inclusive programming and targeted outreach to youth who are marginalized due to disability.

Table 2 presents job constraints facing youth, the programs that address them, and how mobile is trying to make an impact.

Table 2: Youth Employment Constraints and Youth Workforce Development Programming		
Youth Employment Constraints (The World Bank, 2010)	YWD programming (adapted from JBS International, 2013)	How mobiles can help?
Job-relevant skills constraints: insufficient basic skills, insufficient entrepreneurial skills technical skills mismatch, or behavioral skills mismatch	Workforce education and training, including technical and vocational training and education (TVET); basic or vocational technical education; job skills training; apprenticeships; and life skills training	Allowing youth to directly receive, access, produce, and interact with relevant educational content; enabling teachers, trainers, and staff to improve their approach to teaching and learning through engaging formats; enabling learners, teaches, and staff to measure and track results of their efforts
Lack of labor demand at both the macro level, because of slow job growth, and at the micro level, because of employer discrimination	Demand-side policies and programs, for example, broad-based economic growth programs like national youth employment policies, value chain development, public works programs, wage subsidies, minimum wage and tax breaks for employers	Creating jobs within the mobile industry and along the mobile value chain; creating information-related jobs; enabling cash transfers for wage and training subsidies; encouraging more inclusive sourcing of workers in mobile industries; creating micro-work opportunities
Job search constraints such as lack of information about job openings or inability to communicate skills to potential employers	Employment services, such as on-going job referral services that bring employers and workers together through job postings, job fairs, job shadowing, job placement, resume preparation, and coaching	Connecting youth to job opportunities; connecting youth to career counseling through mobile social networks; assigning and signaling certification for mobile CVs
Firm start-up constraints including lack of access to financial capital or business networks	Entrepreneurship and enterprise development, such as support programs for self-employment and business development, including entrepreneurship training, mentoring, and financial services for loans and capital	Catalyzing opportunities for youth entrepreneurship in the technology sector via training, incubation, connection, community-building, and funding; enabling access to and organization of timely and relevant information that supports the development and management of farms and small enterprises; connecting youth to money-making opportunities, and local and global markets

Social constraints on the supply side, such as social norms that limit skills development or entry into the labor market (The World Bank, 2010)	Social norms programs [14] support effective participation of excluded groups, non-traditional skills training, safe training and employment spaces for excluded youth, and broader awareness campaigns	Enabling alternative and non-traditional mentoring, training, and work opportunities for excluded groups; enabling youth with disabilities to access work opportunities; behavior change campaigns aimed at changing societal and individual attitudes about the involvement of excluded groups in the labor market

The following sub-sections map out a wide range of examples of mYWD programs, from early-stage pilots to established, externally-evaluated programs. The evidence base for YWD programming in general is still being developed (USAID, 2012) and evidence on the role and impact of mobiles in youth workforce development programs specifically is even less well established. For this reason, the viability of the majority of the initiatives listed below has yet to be demonstrated. Stakeholder incentives and the underlying economics related to mYWD are not fully understood. Nor has the potential of mobile devices versus their actual role and impact in supporting YWD and youth employability been adequately explored. Indeed, in most cases the potential for sustainability and scale are still being worked out. Nevertheless, innovations in technology, the emergence of new business models, and other changes in the landscape are likely to affect all of the initiatives listed below.

An overview of this dynamic landscape can help people working in the mYWD space gain an understanding of the different types of initiatives being implemented and the challenges they face. This can help people in the field discern initial practical lessons and identify questions for further exploration so that the full potential and scale of mYWD programs and applications can be realized and more young people can achieve their goals for decent work and sustainable livelihoods.

1) Strengthening Job-Relevant Skills through Mobile-Enabled Youth Workforce Education and Training

Job-relevant skills are needed to perform well in any job. However many youth do not obtain a core set of skills in school, do not complete school, or lack opportunities to develop the skills that would help them find and sustain meaningful employment.

Workforce education and training programs address job-relevant skills constraints by supporting or reinforcing:

- Basic education, literacy, and numeracy
- Language learning
- Hard skills and technical training
- Soft skills training
- Entrepreneurial training

Some workforce education and training programs are integrating mobile devices to:

- Allow youth to access and participate in relevant education and training
- Help staff, teachers, and trainers create richer and more relevant curricula and content

[14] Added for the purposes of this paper

- Help youth access information about education and training programs, both online and face-to-face
- Enable youth, staff, teachers, and managers to better measure efforts, progress, and results[15]

Basic education, literacy and numeracy

Many mYWD initiatives seek to improve cognitive skills through basic education, and support for literacy and numeracy. These initiatives range from use of mobile applications to support literacy and numeracy among rural populations, to text messaging and reinforcement of literacy through story-telling and social networking, and classroom-oriented, video-based education.

Some of these programs work within a more traditional classroom setting. The BridgeIT project in Tanzania, for example, incorporates a blended learning approach to basic education and soft skills training. Teachers are trained to integrate educational videos stored on a smart phone, a portable media device, or accessed directly via the Internet into the classroom as core elements of the learning process (Enge, 2011).

Other programs, such as PAJE-Nièta, a program by Education Development Center (EDC) in Mali, is aimed at youth in rural areas who do not have access to secondary school education. EDC trains local teachers to create literacy, numeracy, and language reinforcement content for use through Stepping Stone, a mobile-based curriculum tool. EDC plans to reach 12,000 youth by 2015 with basic skills reinforcement so that the youth can use mobile tools more successfully to improve their livelihoods (mEducation Alliance, 2013).

Table 3: Examples of Youth Workforce Education and Training Initiatives

Basic education, literacy and numeracy
- PAJE-Nièta (Mali)
- BridgeIT (Tanzania)
- The Jokko Initiative (Senegal)
- Project ABC (Niger)
- Girls Literacy (Pakistan)
- Fundza (South Africa)
- Yoza (South Africa)

Language Learning:
- BBC Janala (Bangladesh)
- Najja7ni (Tunisia)

Hard skills:
- Khan Academy (global)
- SHOPS (Uganda)
- AMREF (Kenya)
- TechChange (global)
- Youth ICT Toolkit (global)

Soft skills:
- eLife (22 countries)
- Young Africa Live (South Africa)
- Ummeli (South Africa)

Entrepreneurship training:
- Shaqodoon (Somalia)
- Build your Business (global)
- g.Maarifa (Kenya)

Cognitive skills refer to the basic abilities used for thinking, studying and learning, including literacy and numeracy.

Language learning

Formal jobs often require mastery of an official language. Mobile language learning programs use audio, quizzes, and game-like approaches to help users learn. BBC Janala supports English language learning for Bangladeshis living on under under two GBP a day with daily three-minute audio lessons that can be accessed via a short code on a mobile or downloaded from the mobile Internet site. The program is the largest, multi-platform English language initiative in the developing world: As of September 2011, a total of over 15 million calls had been made to the mobile service and more than 250,000 audio lessons had been downloaded from the mobile site.

[15] See Annex 1 for further information on all the mYWD projects reviewed for this landscape review.

Secondary and higher education

A **short code** is an easy-to-remember number (three to six digits depending on country, such as "911" in the United States) that can be obtained from a mobile network operator. Short codes are easier to remember than long numbers. They are often used to create free call or text numbers.

Many for-profit companies and universities are moving into the distance learning and training space, especially through massive open online courses (MOOCs).[16] Coursera launched in April 2012 and has since had over three million people enroll in its courses. MOOCs are generally geared towards individual learners with a good Internet connection and are often focused on higher education rather than basic education. Khan Academy's videos are open to the public to join and follow along. Khan is a proponent of "flipped" classrooms, in which lectures are presented in in videos accessible outside the classroom, giving students more quality time for group work and discussion with teachers during class time.

Hard skills training

Hard skills are the specific skills required to perform a particular job.

Soft skills are the skills related to personality and behavior traits, such as self-esteem, critical thinking, reliability and collaboration.

Hard skills training helps youth obtain the specific skills required to do a particular job. Youth can use mobiles to access information about face-to-face training or use a device to participate in the actual training. Text message reminders and quizzes can also reinforce hard skills learned during face-to-face training.

Examples of hard skills training include the ICT Toolkit aimed at helping program managers develop relevant training modules in three areas that were determined to be high growth sectors: ICT, agriculture, and health (See Box 3). The social enterprise TechChange also offers online training focused on ICTs for Development (ICT4D).

[16] Massive open online courses bring free distance education using open educational resources (OER) to huge online audiences.

Photo: Elie Calhoun, Code Innovation

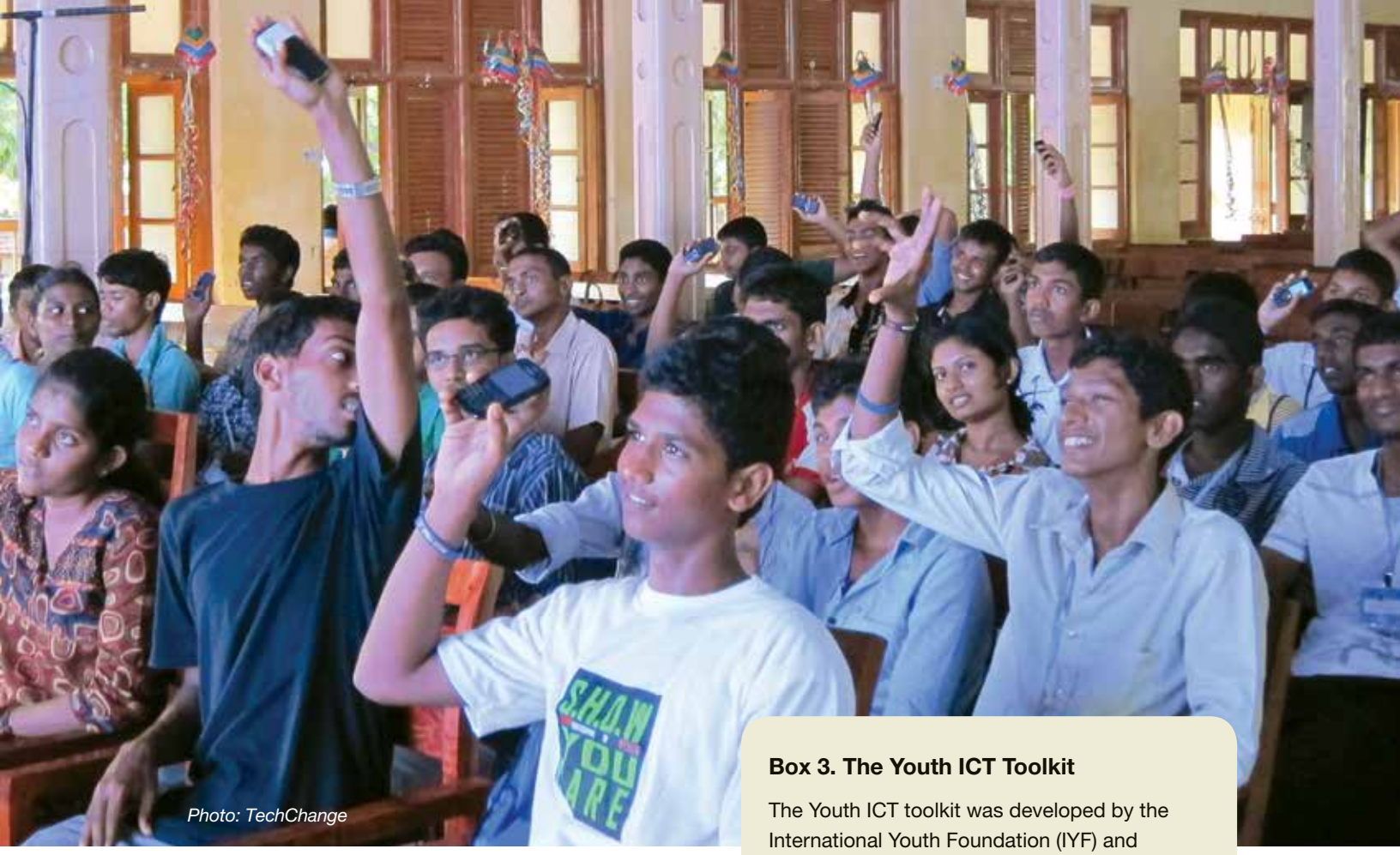


Photo: TechChange

Soft skills training

Some organizations are using mobiles to support soft skills training in areas such as self-esteem, confidence, leadership, initiative, self-direction, critical thinking, collaboration, creativity, financial literacy, and problem solving. In workforce development, soft skills have been found to be of equal or greater importance than specific hard skills over the long term (Burnett & Jayaram, 2012; The World Bank, 2010).

The landscape review will point out many mYWD efforts that include the reinforcement of soft skills as part of their core activities. For example, Akazi Kanoze in Rwanda, Shaqodoon in Somalia, and the ICT Toolkit (focused on East Africa) all integrate mobile devices and soft skills with other program elements.

ChangeCorp launched a tablet-based soft skills curriculum called "eLife" in Colombia with 160 teachers in five public schools. Teachers received tablets and training on how to use them to integrate

Box 3. The Youth ICT Toolkit

The Youth ICT toolkit was developed by the International Youth Foundation (IYF) and Education Development Center (EDC) as part of the EQUIP 3 program to empower local partners to implement youth employability programs in three sectors: ICT, health, and agriculture. These were identified as growth industries with a high potential for employing youth. Program managers can use the toolkit to establish training programs that help youth gain the skills required to secure formal employment or start their own businesses in ICT-related areas such as web design, sales, cyber café management, mobile application development, call center agents, and network management and ICT hardware maintenance; various agricultural areas; and a number of health jobs such as data entry and health data manager.

The program uses a holistic approach, incorporating life skills, basic computer skills, English language and entrepreneurial skills. For each job/skill set, the toolkit provides an overview of the job and expected training outcomes, along with student prerequisites. It also provides information about existing curricula, required technology and teaching methods that work best for each course (EQUIP3, 2011).

soft skills lessons within the classroom. Whereas only 200 students were initially involved in a face-to-face after school program to strengthen soft skills, this new approach includes all 3,900 students in all five schools. For the first time, teachers have begun using the tablets to communicate and collaborate with one another across school districts. They use tablets to videotape classroom sessions and to share experiences and lesson plans.[17]

Entrepreneurship training

In places with few available formal jobs, entrepreneurship and informal job training can help youth better start up and manage small enterprises. Entrepreneurship training modules can be delivered via mobile devices, even in remote areas with no Internet connection. The Shaqodoon program (see Box 4), for example, used interactive radio instruction supported by portable media and portable storage devices. Learner progress was measured through mobile-based quizzes using Interactive Voice Response (IVR) and text-based quizzes.

Interactive Voice Response (IVR) allows callers to generate action via a menu of options by voice or by responding to questions using the keys on their mobile phone.

Self-paced learning in this context describes the practice of users accessing relevant online content, finding topics of interest, and learning at their own pace.

The early-stage Kenyan g.Maarifa mobile application uses a *self-paced learning approach* to entrepreneurship training, in which users walk through short training modules and an orientation to the skills needed to be an entrepreneur. g.Maarifa modules include entrepreneurship, financial literacy, and professional etiquette. Users who pass a final exam receive a certificate backed by the Kenyan Ministry of Education and g.Maarifa's job matching service facilitates placement of higher performing students. Pilot testing in September 2012 showed a 20-point gain in overall knowledge of entrepreneurship, financial management, and professional etiquette and 32 percent of participating students got their preferred job placement.

> *"There's a lot of opportunity in mYWD. The bottom line is how to get kids into jobs. There are specific opportunities out there, so the question is how can we make them accessible?"*
>
> **Samuel Suraphel,** International Youth Foundation

Research findings on mobiles for youth workforce education and training

As shown above, mobiles are being used in numerous ways to help youth overcome job-related skills constraints through education and training. The promise of mobiles in youth workforce education and training is hindered by a number of barriers. Solid evidence of the impact of mobile technologies on youth workforce education and training is hard to find. Because mYWD is still a nascent field, research in this area is dispersed and findings are often buried within reports from other disciplines. Nevertheless, practitioners have identified some key challenges and the available literature offers initial lessons that can help people in the field think through program design and other aspects of mYWD programming and identify areas for further research and exploration.

[17] Louise Guido, CEO of ChangeCorp, key informant interview, February 2013.

Box 4. Somalia Youth Livelihood Program (Shaqodoon)

The Somalia Youth Livelihood Program, locally known as Shaqodoon, implemented by the Education Development Center (EDC) between 2008 and 2011 in Puntland, Galmudug, and South Central Somalia, worked with at-risk 14–24 year old youth to strengthen access to training, internships, work, and entrepreneurial opportunities. While taking advantage of some traditional methods of training and job matching, Shaqodoon staff combined innovation and several types of media to develop both hard skills and soft skills that address a range of problems facing out-of-work youth.

To provide youth with training on financial literacy and workforce readiness, Shaqodoon used an interactive audio component similar to interactive radio instruction. In this component of the program, called "Dab iyo Daham," prerecorded lessons were provided to instructors on MP3 devices and played for youth. Once the recording was completed, instructors dialed into a centralized phone system that allowed them to structure discussions around the lesson and students to submit answers about the lesson. Shaqodoon decided to use MP3 technology rather than traditional radio broadcasts for several reasons. Uneven reception in Somalia can disrupt broadcasts whereas MP3s can be replayed and shared with groups multiple times. This gave instructors additional flexibility and allowed students to go back and review material they had already listened.

Shaqodoon's InfoMatch service linked youth to training and work opportunities through mobile phones and email. Youth registered for the service via SMS or email and created mini-CVs through a mobile application. Youth could search this database using SMS, online, or by calling a phone number; employers had access to the database of CVs. The use of mobile technology to connect youth with employers proved more efficient than traditional methods and reached rural and nomadic populations more effectively.

Shaqodoon also used SMS as a survey tool to collect real-time information during the program. Short questionnaires allowed the program staff, schools, businesses, and other stakeholders to gather key information about the youth using these programs. In addition, key information and alerts were sent to program participants and constituents by SMS.

A 2012 meta-study on lessons in technology teaching and learning from EDC summarizes the benefits and drawbacks of a range of technologies. The study notes that there is no longitudinal, irrefutable body of evidence proving that computers alone improve learning outcomes. It also notes that despite the excitement over certain newer technologies, such as tablets and smartphones, there is little or no evidence proving their worth as learning and teaching tools (Burns, 2012). Similarly, a 2012 report about mobiles and employability in Europe and Eurasia states that there is no evidence that the use of a mobile device has any influence on an individual that would increase employability (USAID, 2012b). The EDC study does conclude,

"Mobile technology cannot be the primary piece of your program. You need to see how to stitch mobile into the human process. Just because mobile exists doesn't mean it should be a quintessential part of a program. It should help catalyze and support you to reach your goals. There needs to be design and intention from the start. If you try to use mobile and don't use it right you've lost the whole advantage."

Samuel Suraphel, International Youth Foundation

Photo: Winrock International

however, that technology can provide learning benefits when it is well integrated into broader programs and the environment is conducive to the flourishing of both learning and the use of technology. The cost of establishing irrefutable evidence may explain the gap in research.[18] Although some newcomers to the field of educational technology may believe that technology alone can impart learning, it is widely recognized by educators, academics, and practitioners that technology is not a stand-alone replacement for well-designed education and training programs.

Lessons learned

The quality of education techniques is more important than the medium of delivery

A review of the literature and evidence regarding the relative influence that educational techniques, timing, setting, and media used for delivery have on learning outcomes for health workers, found that educational techniques are the most critical factors for learning. The medium of delivery mattered less than the techniques used. Multiple techniques that facilitate interaction and allow learners to process and apply information appeared to be the most effective.

This study examined several randomized control trials (RCT) comparing self-paced or individual instruction using computers, live instruction, group instruction, and combinations of the three. The RCTs showed a wide range of results, many of which reinforce the use of computers and mobiles to deliver instruction with increased efficiency and reduced cost. Self-directed learning conducted in a didactic style did not appear to be effective, yet self-directed learning using case-based or simulation techniques did show positive learning outcomes. The study highlighted the importance of interactive techniques that require learner engagement. The most effective educational tools are interactive programs that engage learners and educators. The study recommends selecting education media for instruction based on their ability to deliver a desired technique to the intended location, at the most appropriate moment. It cautions against allowing the desire to use a new medium or device to determine the chosen educational technique (Bluestone et al., 2012).

There are very few studies that measure the success of one type of technology or device for education and training over another. These types of studies are generally costly to conduct and it is difficult

[18] Matthew Kam, AIR, personal communication, May 2013.

to attribute results to a particular device. In addition, as mentioned above, it appears to be more important to focus on the educational technique than the medium of delivery. An evaluation of EDC's Shaqodoon program in rural Somalia, however, found that in a practical sense, using mobile phones or MP3 players to deliver audio lessons provided benefits over radio instruction, which suffered from uneven reception and disruption of broadcasts. In addition, participants could go back and listen to a missed lesson at a later time. MP3 players lowered costs by providing programming for several listening groups at a time in the same area (Education Development Center, 2012).

Blended learning is more effective, especially for weaker students

Successful mobile education programs normally use blended learning methods, where the device is part of a broader approach that includes innovations in the way classes are structured and strong support and accompaniment from a trainer, teacher, mentor, or peers (SRI International & Microsoft Partners in Learning, 2011; Enge, 2011). An evaluation of the Obra program in Latin America supports the idea of blended learning. Evaluators found that self-paced learning is difficult in situations where youth do not have the habit or capacity for self-motivation, for example, among marginalized youth and youth with low levels of education or special needs. Pezzullo (2011a) emphasized that the addition of a mobile device does not mean that the teacher or facilitator can be completely removed from the picture.

An evaluation of the BridgeIT blended learning program showed positive results from the use of mobile video in the classroom: the test scores of students in both math and science were an average of 10 to 20 points higher in BridgeIT schools than in non-BridgeIT schools. Some students advanced a great deal, however, while others were left behind, thus skewing the average. The element that significantly affected test scores positively was whether or not the teacher helped students understand the video lessons (Enge, 2011). Similar findings were reported in a study on a mobile game-based English language program in rural India. Learning benefits were uneven; weaker students benefitted more from a teacher-directed pedagogical intervention, while stronger students responded well to a self-paced, machine-based approach to learning English. The rural children with a stronger academic foundation appeared to be positioned the best to take advantage of the benefits conferred by cellphone-based learning (Kam, Kumar, Jain, Mathur, and Canny, 2009).

The review found only one evaluation related to ICTs and training for entrepreneurship[19]—an evaluation of the HP Life program that provided online and face-to-face training and access to Internet resources for micro-entrepreneurs in 49 countries to expand the potential of their small enterprises with ICT and business skills. The evaluation found that the program effectively improved participant employability, income, and the efficiency of business operations. Participants did not consider advanced ICT skills essential and instead tended to employ basic tools such as email, Internet, and text processing (such as Microsoft Word) more than advanced tools like databases. Blended learning, involving face-to-face instruction with computer-based support, was rated the most beneficial mode of instruction. Mentoring and encouragement were important factors, especially for female trainees (EQUIP3, 2012a). The program did not use mobile devices, but lessons from the evaluation can inform future entrepreneurship training programs.

Text messages can reinforce basic learning and behaviors

Three completed evaluations showed a positive impact of text messaging or private mobile text message networks on short-term literacy reinforcement (Beltramo & Levine, 2010; Miyazawa, 2009;

[19] See the section "Mobiles for Youth Workforce Education and Training" for examples and evidence of how mobile is supporting education and training efforts.

"In the case of workforce development, chances are that the competencies are too broad and complex to impact via text message. Effective learning is not passing on knowledge or pushing content. It's developing knowledge, skills and attitudes. Many ICT-based projects are pushing or transferring content rather than building skills and competencies. This is less expensive but not as effective as more intensive approaches."

James Bon Tempo, Director of ICT and Innovation
Johns Hopkins Center for Communication Programs

Aker, Ksoll, & Lybbert, 2010). Initial assessments of pilot programs in Afghanistan and Ghana that used mobiles and other new technologies for healthcare workforce and on-the-job training found that SMS (short messaging system) messages were a useful complement to other capacity building efforts. In both cases, anecdotal evidence suggested that SMS builds motivation with calls to action. For example, on their own initiative, participants took on additional health education activities such as hanging posters in the workplace to remind themselves to wash hands or to respect patients' rights to privacy and confidentiality. Though the number of respondents was small (40 of the 637 participants), a survey showed that 80 percent of respondents were satisfied and appreciated the initiative. Fifty percent of the respondents reported having forwarded SMS messages to colleagues and 75 percent recommended continuing with SMS-based reinforcement efforts (Naimi & Amarkhail, n.d.). The Uganda pilot used mobile phones to improve health outcomes by identifying and closing performance gaps in adherence to clinical protocols such as hand washing, sharps disposal, and preparation of chlorine solutions. Post-pilot interviews with program participants suggested the high acceptability of text messages for performance improvement and included negative responses regarding unclear messages and frustration with technical problems (Riley & BonTempo, 2011).

Although some evidence is emerging on the benefits of SMS for reinforcing learning, participation and response rates in some cases are low and it is not clear how long learning or behavior changes are sustained following the completion of a program. One practitioner cautioned, however, that some competencies required for hard and soft skills training for employability may be too complex to achieve via text messaging. It is important to first determine the learning goal, then select the best technique for achieving each learning outcome, and only then consider whether a mobile–enabled approach—and which one—is appropriate.[20]

Cost is a significant barrier for youth access to information and content

Although access to the mobile web is growing rapidly, a 2012 study in eight countries found that public venues with Internet access, such as libraries with Internet-enabled computers, are still critical parts of the youth information ecosystem. While the majority of people who access the Internet in public spaces do own a mobile phone, data access is still costly and most do not have access to mobile Internet. Even when they do, however, the cost and limited functionality of mobile phones mean that they continue to use computers and the Internet in public venues for more complex tasks, such as homework and data storage. The study suggested that organizations needed to better understand user repertoires and offer content and opportunities across a number of spaces and devices. It also noted that many youth have difficulties accessing data due to cost and that programs should keep this in mind during design work (M. Walton & Donner, 2012).

[20] James Bon Tempo, Johns Hopkins Center for Communication Programs, key informant interview, August 2012.

Practitioners tend to agree that cost is a significant barrier for mobile education and training: For many youth with whom they work, even the cost of a simple SMS message is a deterrent. Some mYWD practitioners suggested that governments and mobile network operators (MNOs) should work to overcome these cost barriers in an effort to stimulate mYWD activities.[21] Focus groups and surveys of youth conducted by the GSM Association's Mobiles for Development unit in Ghana and Uganda found that a high percentage of youth surveyed about mobile Internet usage said they would be interested in learning through mobile phones and receiving information on jobs and prospective employers, internships, and career advice. Even though the youth surveyed had access to mobile Internet, they still listed cost as a deterrent. Youth did say that they would be willing to accept advertisements as a way to make services accessible and sustainable (Dawes & D'Elia, 2011a, 2011b).

"We need MNOs to provide subsidized or zero-rated access to content."

mYWD survey respondent

Local adaptability and sustainabilty remain a challenge

Issues such as youth's low access to data and the mobile web, the lack of culturally relevant content in local languages, and the difficulty producing regularly updated educational content, need to be considered and overcome. It is difficult to share large amounts of content via SMS, yet practitioners express concern about using tablets and smartphones in contexts where the ecosystem for deploying them does not exist and where there are few affordable data plans or repair shops.[22] An evaluation of World Reader's iREAD Ghana program found that although students and teachers had a positive experience with e-readers, almost 50 percent of the devices broke and there was no reliable local repair or replacement network (Worldreader, ILC Africa, & USAID, 2012). The organization subsequently addressed the breakage issue by purchasing devices with specially reinforced screens and improved protective coverings. These improvements reduced breakage to six percent in one program and to zero percent after five months of operation in another (Worldreader, 2012).

The **Bring Your Own Device (BYOD)** approach, where people participate using their own devices, is commonly cited as the most sustainable approach since it does not require giving out devices, and it relies on available ecosystems and infrastructure.

Most practitioners recommended the "BYOD" (bring your own device) approach where people use their own devices to participate in programs. But since most youth in developing countries do not have feature phones or smart phones, this means working with text messages in order to include the largest number of participants. It is important during program design to be clear about educational and skills training goals and to conduct a thorough assessment of the local communication ecosystem to identify (a) devices the target population can access, (b) services they can afford and regularly access, and (c) information sources they trust. In areas where people can only access basic phones, program designers must keep the lowest common denominator in mind: SMS or USSD (unstructured supplementary service data). The BYOD approach may also leave out people who may not have access to a mobile device, such as girls and young women.[23]

[21] Key informant interviews, David Harrison, Career Planet and Lauren Kotze, Ummeli, August 2012.

[22] Stephane Boyera, World Wide Web Foundation, key informant interview, August 2012.

[23] Key informant interviews with Wayan Vota, Development Gateway and Educational Technology Debate; Samuel Suraphel, International Youth Foundation; James Bon Tempo, Johns Hopkins Center for Communications Programs; John Traxler, International Association for Mobile Learning; Dan Sutera, Impact Network; Mika Valitalo, Plan International; Tuulia Virhia, Plan International, Finland; and Stephane Boyera, World Wide Web Foundation.

Photo: Paul Kim, SMILE

Box 5. Young Women, Workforce Development, and Mobile

Gender discrimination is a major issue impacting workforce development outcomes. Data collected from YWD programs across 26 countries showed that 19 percent fewer female youth completed work readiness training, almost 30 percent fewer completed vocational training, and 12 percent fewer finished entrepreneurship training programs. In general, fewer females also reported finding a job or starting an income generation activity post-training (EQUIP3, 2012b). Gender norms impact how families allocate resources to sons and daughters, who attends school, whether one is allowed to work and what kind of work is done, and generally how time is spent (USAID, 2012a).

Good practice in YWD programs suggests that programs be designed in ways that fit the lives of girls and young women and address underlying gender discrimination by:

- integrating gender-sensitive content into training;
- selecting safe spaces for training;
- providing female mentors and role models; and
- addressing underlying cultural factors that define norms about work (EQUIP3, 2012b).

Inclusion of a gender lens throughout the program cycle can help programs to be more relevant and accessible for girls and young women during

- outreach and selection of youth for training;
- selection and preparation of trainers;
- provision of support services;
- outreach to parents and communities;
- outreach to potential employers and workplace; and
- data collection and monitoring and evaluation (International Youth Foundation, 2012).

When integrating mobiles into youth workforce development programming, gender disparities related to access and use of mobile need to be considered. Because women and girls are viewed as second-class citizens in many societies, access to information is not seen as a priority for them (Cherie Blair Foundation for Women & GSMA Development Fund, 2010). Household chores, lack of mobility, and the often male environment in public access sites also reduce girls' access and use of ICTs. In homes with only one mobile phone, girls and women may only have access to mobile when given permission. In schools, boys may outnumber girls and dominate available ICTs, leading to girls' feeling less confident about using technology (Plan, 2010).

Mobiles can play a role in helping girls and young women overcome barriers to employment by:

- helping them access literacy reinforcement, basic education, self-directed learning, and training opportunities;
- enabling girls and women with limited mobility to work remotely, e.g., though microwork;
- providing platforms and social networks for girls and women to mentor and encourage one another; and
- serving as a private way to access information, training, and advice, rather than through a more public, face-to-face approach.

Organizations working with mobile and youth workforce development might keep several considerations in mind:

- Mentoring, coaching, and training conducted by women for women is helpful and important both to boost levels of trust and to offer role models that encourage women to start businesses and enter the labor market.
- While the ICT sector is a growing area offering great opportunities, young women may need additional encouragement to enter non-traditional employment in jobs involving ICTs or in the sector itself.
- Soft skills may be even be more important for young women than for young men because of gender-based, sociocultural limitations that girls and women face, such as lack of mobility and low self-confidence.
- Training programs need to offer a flexible schedule in order to accommodate women's household responsibilities and, in some cases, limited mobility.

Although in some cases mobile can support girls' and young women's access to workforce development programs, on their own these programs are not enough to achieve wider impact. A young woman may find a scholarship or a job via mobile, for example, and not be able take advantage of it because of wider cultural restrictions and attitudes about girls and women leaving the home, being educated or entering the job market. Deeper cultural shifts need to take place if girls and women are to participate fully in workforce development and the wider labor market.

Gender barriers are high

Girls and young women generally have less access to mobile devices, less access to education and training opportunities, and restricted mobility. Cultural barriers and low self-esteem can deter girls and young women from enrolling in or completing workforce development training (see Box 5). Recommendations for addressing gender barriers in youth workforce development training begin with applying a gender lens throughout the entire program cycle and including gender-sensitive content. This means providing good role models, addressing cultural factors that define gender norms about work, ensuring that girls and young women enroll in and complete training, and ensuring that training is held in safe spaces for girls and young women (International Youth Foundation, 2012; EQUIP3, 2012b).

Youth with disabilities are often excluded from education and training programs

An International Telecommunications Union (2013) report on disability reported that of all out-of-school primary school age children worldwide, one third are children with disabilities. In addition to education barriers, societal and attitudinal beliefs that it is not possible to educate children with a disability are widespread. Some cultures hold that disability is a curse from God. In some cases, persons with disabilities are not expected to work and can only receive an income through begging. Worldwide, it is estimated that unemployment among the disabled is as high as 80 percent. While inclusive ICTs, and assistive technologies in particular, can offer people with disabilities access to educational content, content alone is not sufficient to break down the barriers facing youth with disabilities. Pal, Freistadt, Frix, and Neff (2009) recommended accessible buildings and workstations, supportive attitudes and beliefs, and targeted and inclusive programming to help youth with disabilities access workforce education and training and secure jobs. Accessibility features in mainstream ICTs are in use in some classrooms and there is a growing global effort to develop inclusive educational policies. In order to make gains in this area, however, more work is needed to support teachers who struggle to use modern ICTs or to facilitate the use of assistive technologies in the classroom or in other settings where learning takes place (UNESCO, 2011).

> *"We need research on what exactly are the gaps in skills that ought to be targeted. Simply saying that youth lack employability skills or don't have enough 21st Century Skills is vague."*
>
> **mYWD survey respondent**

Gaps in the research on mobiles for youth workforce education and training

Despite widespread belief in its potential, it is not yet clear whether mobile-enabled YWD training and education is ultimately effective in helping youth obtain and maintain good jobs and increase their earnings, or whether mobile-enabled YWD approaches are more effective than traditional approaches. The difficulty in identifying what works in mYWD is exacerbated by the emergent nature of the evidence base in YWD programming in general.

Potential research questions

- What skills gaps need to be overcome, by which youth and in which contexts, in order for them to become successfully employed? What education and training techniques would help youth attain those skills? Which combinations of educational techniques and mobile devices could support strengthening of those skills?

- Can mobile devices enable programs to reach larger scale with comparable learning or job placement outcomes at the same or lower cost than non-mobile-enabled programs?
- What kinds of business models and partnerships would make mobile-based education and training sustainable and scalable? What conditions are needed for mobile-based education and skills training to reach scale in which contexts?

2) The Role of Mobiles in Increasing Labor Demand

In many countries, a poor economy and elements such as a difficult investment environment, natural disasters, or conflicts, result in a low demand for labor. In addition, discrimination against youth at the micro-employment level often means that youth are not hired for available jobs (The World Bank, 2010). Youth are three times more likely than adults to be unemployed, even in countries with strong economies (International Labor Organization, 2012b).

Even though low demand for labor is a major constraint for youth employment, very few programs address the demand side through job creation. The majority of workforce development programs focus on the supply side by helping youth better prepare for work. A 2010 survey of 167 youth employment programs in developing countries found that only 12 percent of programs focused on job creation (Ikatu International, 2010). Similarly, an inventory of the World Bank's youth employment programs found that only 21 percent supported the demand side (Puerto, 2007).

Table 4:
Examples of mYWD Demand-Side Programs

Industry creation of jobs:
- Poverty Reduction through Information and Digital Employment (PRIDE) (Kenya, Ghana, India)

ICT- & information-related jobs:
- Grameen Community Knowledge Workers (Uganda)
- Movercado (Mozambique)

Subsidies:
- Waseela-e-Rozgar (Pakistan)
- Impact Sourcing (Africa)

Microwork:
- Digital Divide Data (Cambodia)
- Jana (global)
- Samasource (Haiti, India, Kenya, Uganda)

Demand-side workforce development programs include:
- strategies that address a slow-growth economy such as industry creation of employment opportunities, wage or training subsidies, public service programs, and public works programs; and
- strategies, such as affirmative action, employee mentoring, and the creation of micro-level work opportunities (The World Bank, 2010).[24]

Mobiles and the mobile industry contribute to demand-side programming by:
- creating jobs in the mobile industry and along the mobile industry value chain;
- growing ICT- and information-related jobs;
- enabling cash transfers for large-scale subsidy programs;
- encouraging more inclusive sourcing of workers in technology industries; and
- creating micro-work opportunities.

[24]Demand side strategies include support for self-employment and entrepreneurship, training in entrepreneurship and business management, and support for starting businesses and farms. This paper includes these under Entrepreneurship and Enterprise Development.

Industry job creation

The ICT sector, including the mobile technology industry, has been identified as a growing field in many countries. It is considered a key factor in both national and international economic growth. The total of global e-commerce is estimated to be US$16 trillion in 2013. When the global market for digital products and services is included, the total size of the digital economy is estimated at $20.4 trillion (Jayaram, 2013; Oxford Economics, 2011). As the uptake of mobile continues to grow, jobs along the mobile value chain, such as mobile money services, sales of airtime, and mobile repair are also expanding (International Telecommunication Union, 2012c).

A report from the Cherie Blair Foundation on women entrepreneurs in MNO mobile retail value chains[25] notes that women, including young women, derive income from low-level jobs that involve mobile phones, but they do not often rise into higher levels of the value-chain where they could generate more income. Though women commonly outnumber men in terms of selling airtime and SIM cards, they rarely take on higher-level roles such as distributors or owners of larger-scale retail outlets. MNOs have extensive retail channels whose coverage extends into remote rural areas. These retail channels are often conduits for other important services such as aid distribution, education, and health services, and as extended value chains they can offer further economic opportunities for women entrepreneurs. Yet gender barriers prevent women from moving into better paying jobs and higher levels of responsibility. The Foundation aims to develop partnerships with mobile industry leaders to develop programs that enable women entrepreneurs to better capitalize on the growth of the mobile industry (TNS, STC, & Cherie Blair Foundation for Women, 2012).

Infomediaries connect their communities to new sources of information that would otherwise be inaccessible. While communities often have limited access to the Internet or mobile phones, infomediaries have the necessary language and technical skills to gather and analyze information, bringing it back to their communities in a useful way. Organizations can provide access points for a smaller number of community members, but benefits spread further into the community. Infomediaries support community members who are illiterate, lack Internet or mobile connections, or don't have other means to gather information themselves.

Infomediaries can also gather information to share with the rest of the world. Youth in particular serve as good infomediaries because they are often more comfortable with technology. Working as an infomediary can provide youth with skills they need for future employment.

Information-related jobs and infomediaries

Some governments have begun digitalizing the management and delivery of large-scale programs like health, education, and agricultural extension. Endeavors to modernize preventive and primary healthcare through digital technology and the digitalization of government records may open up new kinds of employment as knowledge workers or infomediaries (information intermediaries) that youth could be trained to fill.[26] In addition, efforts to achieve universal primary education are increasing the demand for teachers. UNESCO estimates that between 2010 and 2015, 114 countries will need to create 1.7 million new teacher posts to ensure quality primary education for all children (UNESCO, 2012a). These efforts include public-private partnerships aimed at improving the quality of education through more innovative teaching and

[25] In this case, the MNO mobile retail value chain is defined as the channels through which MNOs get their products into the hands of end consumers.
[26] Key Informant Interview, Stephane Boyera, World Wide Web Foundation, August 2012.

learning, enabled by mobile technologies.[27] Mobile as a tool for national-level agricultural extension programs has been shown to improve yields (Muyanga & Jayne, 2006; Cole & Fernando, 2012) and may also be a promising area for youth employment.

Some development agencies are expanding the use of mobiles in their programs and training community-level infomediaries. Examples include the Grameen Foundation's Community Knowledge Worker (CKW) program in Uganda and PSI's Movercado in Mozambique. These information-enabled jobs may be especially attractive for youth, but more may need to be done to include young women. Though Grameen set an equal gender composition target for its CKW network, the target has been difficult to meet because few women meet the literacy standards needed for working as CKWs (Grameen Foundation, n.d.).

Box 6. Infomediaries in Uganda and Mozambique

The Community Knowledge Worker (CKW) program, run by the Grameen Foundation employs nearly 100 infomediaries, using mobile phones to provide agricultural information to smallholder farmers in Uganda. The CKWs provide advice, weather forecasts, market prices, market platforms for sellers and buyers, and detailed information on farming a variety of crops. Engaging peers to gather and share information, the CKWs ensure information is relevant, timely, and used effectively in their communities. CKWs also gather information from the farmers they work with to help improve services and address famers' needs.

Movercado, a program by PSI in Mozambique, uses mobile phones to promote the spread of information within a community, turning local health workers into infomediaries trained in health outreach. They go door-to-door conducting health outreach with community members. Once the training is complete, community members are given an SMS code to text a confirmation that the training was completed and to provide an evaluation score about the workers performance. In return for their evaluation, they receive a voucher for healthy products at local stores. This system promotes healthy behaviors, purchasing of healthy products, and feedback on health worker performance, enabling PSI to employ local workers and manage them remotely as well as to keep track of the quality of services provided.

Subsidies

Sometimes governments subsidize business hiring in order to stimulate job growth. They may also offer subsidies to encourage youth to enroll in vocational training or to create small enterprises. As part of the Pakistani government's Benazir Income Support Program (BISP) the Waseela-e-Haq initiative provides women with a grant of 300,000 rupees along with training and counseling aimed at stimulating the growth of small enterprises. This large-scale program works with 7 million families in 56 districts. The program (a) manages cash payments and transfers using smart cards, mobile banking, and branchless banking; (b) targets beneficiaries using a GPS-enabled poverty scorecard survey; (c) verifies identity using a computer database; and (d) collects feedback on performance from program participants through mobile, email, Internet, and other channels.

[27] James Bernard, Microsoft, Key Informant Interview, May 2013.

Anti-discrimination efforts

Often employees are recruited from urban centers or universities, leaving out less privileged youth. *Impact Sourcing* engages the business process outsourcing (BPO) sector in providing skills training and creating work opportunities for young people from lower resource or rural areas rather than from university-focused recruitment efforts (Kubzansky, 2011; Bulloch & Long, 2012). The Rockefeller Foundation's Digital Jobs Africa initiative is a seven-year effort that will help youth with limited employment opportunities in Sub-Saharan Africa, the Middle East, and North Africa to access digital jobs. This focus includes (a) digitalization of existing processes and outsourcing back-office services; (b) creation of new products, services, and communities based on the virtual economy; (c) use of new and existing information and "big data" to make decisions; and (d) transactional platforms that enhance access to services and trade, such as eCommerce, eGovernment, and mobile applications. Digital jobs can provide youth with immediate, entry-level employment and at the same time build transferrable skills that will enable them to move into higher-level jobs in the future. Through this initiative, the Foundation and its partners will work to encourage growing digital industries, such as the mobile sector, to consider Impact Sourcing as a hiring practice (Harji, Best, Essien-Lore, & Troup, 2013).

Business process outsourcing (BPO) companies provide administrative and financial services for other companies, for example, call center and customer service activities, and accounting and payroll.

Microwork

Several for-profit and social enterprises, including Samasource, Jana, Digital Divide Data (DDD), Amazon Mechanical Turk, and Crowdflower offer microwork or microtasking opportunities to young people as a way to generate income. Microwork for Samasource and Digital Divide Data is accompanied by additional hard and soft skills training. These entry-level work opportunities can help youth to increase their experience and develop positive work habits so they can move into better jobs over time.[28] Samasource and DDD work with large companies that outsource digital functions and tasks, including those in the technology sector.

Research findings in mobile technology and demand-side programming

There are few well-developed examples of the role of mobile technologies and the mobile industry in overcoming labor demand constraints and creating jobs for youth.

Lessons learned

Mobile money could help facilitate cash transfers for wage or training subsidies

A number of rigorous studies have looked at the impact of cash transfers on youth employment, poverty, social integration, and violence prevention. Of particular interest for YWD is a program evaluation of the impact of cash transfers on youth employment and small enterprise creation in Northern Uganda. In this program, the government distributed cash transfers worth about one year's income to thousands of poor and underemployed youth, aged 16 to 35, with the dual goals of expanding skilled, non-agricultural employment and reducing poverty. Grants were unconditional and framed as enterprise start-up

[28] Notes from a meeting on January 22, 2013 that included Samasource and Digital Divide Data.

programs. Youth submitted proposals for how they would invest in a trade and applied for grants in small groups. Funds were distributed as a lump sum, which the group distributed among members or spent all together. The study found that after four years, participating youth were 65 percent more likely to practice a skilled trade, defined as working in a small-scale industry or offering services such as carpentry, metalworking, tailoring, or hairstyling. They had much higher business capital stocks and their earnings were 49 percent greater than the control group after two years and 41 percent greater after four years. These youth were also around 40 percent more likely to keep records, register their businesses, and pay taxes. Women especially showed high returns: After four years, incomes of female participants were 84 percent greater than those of females in the control group (compared to the 31 percent gain by male participants over males in the control group) (Blattman, Fiala, & Martinez, 2013).

Transfers in the Northern Uganda program were not made via mobile money. An evaluation of a mobile money transfer project in Niger, however, showed that mobile cash transfers greatly reduced the variable distribution costs for the implementing agency and the costs of obtaining the money for the program recipients (Aker, Boumnijel, Mcclelland, & Tierney, 2012). In light of the positive impact of the Uganda cash transfer program on employment and youth livelihoods, and the growing availability of mobile money and mobile finance, further exploration of the potential of mobiles for cash transfers within large-scale YWD programs could prove worthwhile.

Impact Sourcing can increase youths' incomes, yet greater private sector incentives are needed

Research done as part of the Rockefeller Foundation's Impact Sourcing (IS) initiative looked at creating demand and opening business process outsourcing (BPO) jobs to lower-income youth from poor or marginalized neighborhoods. Data from Monitor Group suggests that Impact Sourcing, including microwork, can increase employees' incomes between 40 percent and 200 percent. Youth often move from entry-level work into higher level, better paying jobs within six months. In addition to the benefits of formal, stable employment, IS employment has been shown to increase family investment in health care and education. A challenge with Impact Sourcing, however, is that many potential clients are more concerned with its cost, quality, risk level, and political implications than with its social impact. In addition, many companies pride themselves on hiring well-educated employees, and require additional incentives to hire youth from lower income areas with lower education levels. IS creates a tension for an employer between employing less skilled labor and meeting client buyer purchase criteria. (Kubzansky, 2011). IS was found to be a viable business model as long there is sufficient demand for the services, when the client (buyer of the services) can meet outsourcing objectives, and when the model offers a competitive and sustainable solution for businesses. The concept is still in its early stages, however, and it is difficult to draw solid conclusions (Bulloch & Long, 2012).

Microwork can lead to higher quality jobs, but is not without challenges

Microwork can help move hard-to-reach youth from simple microtasking to higher quality jobs. Globally, over 100,000 people are employed through microwork, which allows them to reach beyond their local market and to develop a variety of skills (The World Bank, 2012). Digital Divide Data (DDD) reports that most of the youth participants in its microtasking programs move into positions elsewhere or to management within DDD, and the average DDD graduate in Cambodia goes on to make over $250 a month, more than four times the average regional wage (Digital Divide Data, n.d.). Samasource reports that 75 percent of its microtaskers move into better jobs within six months. The organization also reports being able to reach young women who normally cannot find or hold jobs due to limited mobility or low levels of skill (Raftree, 2013).

A study in Eastern Europe and Eurasia found that microwork can support young women in particular because it allows for flexible supplemental income through tasks they can do in their homes in short time periods without harm from frequent interruptions. However, in order for microwork to succeed, it needs to be compatible with local skills and language and offer competitive earnings. The study also found that PCs were superior to mobile phones for microtasking and that mobile-only microtasking platforms were unsuccessful. Most microwork is actually done on a laptop, tablet, or PC as the tasks require a level of complex interaction not possible on a mobile phone. Some workers have used MobileWorks, a mobile microtasking platform, with sufficient success to use their earnings to purchase a PC in order to do more complicated and higher paying or higher volume microwork. There are concerns about the low pay rates of commercial microtasking sites and the lack of legal and worker protection (USAID, 2012b). These concerns need further exploration before microtasking can be recommended as a good practice for youth workforce development.

Gaps in the research on mobile devices and demand-side programming

Further research is needed on demand-side programming. Very few examples of industry-level job creation efforts exist, either within or beyond the technology sector, and more knowledge in this area would be useful for guiding large-scale attempts to stimulate jobs.

Potential research questions

- Which areas hold the most potential for growth in information- and knowledge-related jobs? What skills do youth need to fill these jobs? How can they best obtain these skills? What would incentivize mobile operators or digital firms to hire more young people from marginalized communities?
- Might mobiles be an effective and cost-efficient way to distribute cash transfers or cash grants to incentivize youth training, entrepreneurship, and enterprise development?
- In what contexts and under what conditions is microtasking feasible? What can be done to expand the practice in different contexts? What is a reasonable pathway to move from microtasking on a mobile phone to a higher-level position or work as a small enterprise? How can low pay rates and lack of worker protection be addressed?

3) The Use of Mobiles to Address Job-Search Constraints

Finding out about available jobs and other workforce development opportunities, such as volunteering, apprenticeships, and internships, can be difficult for youth who have few resources for traveling to city centers, purchasing newspapers for their want ad postings, or searching online. Girls and women may have limited mobility and may be unable to seek jobs without asking permission due to cultural restrictions. They may not possess their own funds to support the costs of job hunting. Young people with disabilities may also have limited mobility and be unable to leave home to search for jobs. On top of these constraints, youth often have a limited understanding of how to seek opportunities that fit their interests, prepare themselves for the opportunities they might find, and communicate their capacities to potential employers.

Photo: Linda Raftree, Plan International

Youth employment services help youth overcome job search constraints through:

- job seeking, job matching, and opportunity linking
- career counseling
- skills certification and accreditation

Mobile devices are being used to support and enhance youth employment services by:

- helping youth connect to job opportunities;
- enabling youth to access career counseling or peer counseling through mobile social networks; and
- assigning and signaling certification through mobile CVs that help youth communicate their skills to potential employers.

Using mobiles, youth in remote or hard-to-reach areas can connect with difficult-to-find opportunities and locate information and advice about how to access those opportunities.

Table 5: Examples of Mobiles and Employment Services Programs

Job seek/job match:

- Souktel (22 countries)
- Njorku (Africa-wide)
- Babajobs (India)
- Careerjet (global)
- mPawa (Ghana)
- Dumaworks (Kenya)
- Akazi Kanoze (Rwanda)

Career Counseling:

- Ummeli (South Africa)
- Career Planet (South Africa)

Certification:

- Mozilla Open Badges (global)

Job seeking and job matching

A number of mobile applications allow youth to do job seeking and job matching using a basic mobile phone. Njorku's African Jobs platform and Babajobs in India are established commercial job matching sites with high user rates that function on both web and mobile. Dumaworks, a recent start-up company in Kenya, operates more like a mobile social network for jobs, enabling informal workers to connect to

"friends of friends of friends" to find work. Careerjet is a job-search portal registered in South Africa that works on iPhones and Android phones. It scans jobs in 90 countries and 28 languages and provides an option to search for jobs and work readiness opportunities specifically aimed at people with disabilities. Souktel, a nongovernmental organization that works in 22 countries, is well known for its role in supporting the aid and development community with job match and other SMS-based platforms.

Some programs and services offer young people career advice through mobile and help youth develop peer networks for sharing information about jobs, training, volunteering, and internships as a way to help them remain motivated and engaged in their communities and societies.[29] The Career Planet interactive careers website in South Africa includes online career discovery workshops, teacher training, career readiness support, job shadowing, and sustainable self-employment workshops. In an effort to reach youth without Internet access or advanced mobile phones, Career Planet has created a limited version of its services available via USSD. In addition, staff drive vehicle-based Internet kiosks to rural areas on a weekly basis to allow youth to access the services on the Career Planet website (Korenblum, 2011).

Box 7. Souktel and Akazi Kanoze

In Rwanda, Souktel is working in partnership with EDC on the Akazi Kanoze project. In this project, youth participate in career counseling, job training, and other workforce related opportunities such as meeting with entrepreneurs, employers, and mentors. Souktel designed the job matching system in partnership with the MTN and Tigo networks. Youth can use the system to search for work via text message, access SMS job listings, and create "mini-CVs" at low cost. In addition, program implementers can monitor use of the system and note when youth have been matched with work or further education and training. The program aims to reach 15,000 youth by the end of 2014 in partnership with the Ministry of Public Service and Labor. Job matching via SMS is proving to be a way to reach a greater number of youth at a lower cost than more traditional approaches such as job centers (Education Development Center, 2013a, 2013b).

Signaling competencies

Even if youth have the right skills, they may have difficulty communicating them to potential employers, especially if their skills do not involve formal education and training. Common signals of employability include education and training certificates, and whether a youth held a job in the past. Ummeli (see Box 8) encourages youth to volunteer and to be active in their communities as a way of gaining job experience. Youth receive support for creating mini-CVs that help them profile their skills and experiences. In Chile, IYF's Entra 21 program evaluation found that using an e-portfolio helped youth job-seeking efforts and the introduction of Facebook into the program helped youth become more engaged and proficient online. They posted job advice and interview suggestions for their peers (Pezzullo, 2011b).

The issue of accreditation for online courses has surfaced as online and mobile education and training has become more common. Mozilla's Open Badges initiative is working to create a certification system based on digital badges that can be displayed or used for online CVs, to begin to address the need for recognition of online learning and skill building.

[29] Key informant interviews, Lauren Kotze, Ummeli, September, 2012, and David Harrison and Rumbi Goredema, DG Murray Trust, December, 2012.

Research findings on the use of mobiles to address job-search constraints

The evidence base for the use of mobiles for employment services, though limited, demonstrates the potential of job seeking and job matching to reach scale in certain contexts. Beyond this finding, there is little hard evidence in this area. Most initiatives are just starting out and more time will be needed to see their impact.

Lessons learned

Mobile job matching sites show potential for scale

The for-profit mobile job matching services considered for this landscape review show differing levels of uptake. Babajobs had 300,000 new profiles uploaded in 2012 and reported a 20.1 percent average salary increase among users of the site (Tejaswi, 2013). Njorku reports 10,000 searches and an average of 100 new job seeker registrations daily.[30] Mobiworks in Tunisia had 300,000 subscribers only one month after launching.[31] CareerJet, which began as an online job site, scans 58,000 websites daily for available jobs and drives traffic to those sites. The company created its mobile application in 2009 and mobile traffic showed an increase of 285 percent during 2011. Souktel's capacity to scale is illustrated by its expansion to 22 countries and integration into a number of holistic programs that address various aspects of youth workforce development. Some 30,000 job-seekers and more than 700 employers are registered on Souktel's JobMatch, and over 5,000 job-seekers have been matched with work and training (mEducation Alliance, 2013).

Mobile job matching can save youth time and money

In a July 2011 survey, 84 percent of Palestinian job-seekers using Souktel's JobMatch service reported a 92 percent reduction in time spent looking for work, and 70 percent of Palestinian employers reported a 50 percent or greater reduction in hiring costs and time spent, compared to alternative hiring methods (Souktel, 2011). An evaluation of the Shaqodoon

[30] Churchill Mambenanje, founder of Njorku, personal communication, March 2013.

[31] ProInvest, personal communication, March 2013.

Box 8. Ummeli

Ummeli is a mobile platform in South Africa developed by the Praekelt Foundation. It allows youth to search for jobs and connect with job seekers, providing priority access to job listings, internships, trainings, and other opportunities. The platform also hosts articles that guide youth in their job search and fosters a community where youth can look for and give advice.

Ummeli grew out of Young Africa Live (YAL), a mobile platform that focuses on opening dialogue and frank discussion around sexuality, sexual and reproductive health, and HIV/AIDS. YAL conducts a yearly survey to assess the knowledge and actions of young people around HIV/AIDS. However, one survey asked about the biggest challenges facing South Africa's youth. Half of the responses talked about livelihood, stating that limited job opportunities and employment were a more pressing issue for them than HIV/AIDS. Further, YAL asked their users how its services could expand further to meet their needs. 65 percent of responses asked the platform to add information and resources about jobs and education. The Praekelt Foundation decided to launch Ummeli. By building on the success of YAL, Ummeli engages youth, involving them in discussion and actively working to improve their opportunities.

Ummeli found that many youth stop actively looking for jobs six months after leaving school, so the platform tries to create an attitude shift to help youth stay active and engaged in other opportunities like volunteering and community work. Ummeli members can post opportunities and form communities to share tips or challenges and seek peer advice (Praekelt Foundation, 2012).

Ummeli sits on the Vodafone Live platform and uses Mxit as its basic mobile social network. It is available to those with more advanced WAP-enabled phones at zero cost.

program found that the InfoMatch job matching system was quicker than traditional methods and that EDC was able to more easily reach rural and nomadic populations with job matching services through mobile (Education Development Center, 2012). Girls and young women who cannot leave their homes due to cultural restrictions on their mobility can gain special benefit from mobile job matching (Bachan & Raftree, 2011), however young women may still face challenges taking a job if societal attitudes do not condone women working. The same holds true for youth with disabilities, who may face both mobility challenges and discrimination in hiring processes.

Job matching is not a fit for every context

Although mobile job matching appears to have potential for scale, reach, and cost savings, the context is all important. One study in Eastern Europe and Eurasia found that the contextual factors that make mobile job searching and job matching most suitable include: (a) relatively high levels of unemployment (there needs to be a large enough number of potential employers and employees to justify starting the service), (b) a relatively small informal economy, and (c) strong domestic and donor support for employability programs to match, complement, and supplement efforts (USAID, 2012b). In addition, larger systems need to be in place for job matching to be effective. As one researcher explained, if there are no jobs, a job matching portal becomes pointless (Dawes & D'Elia, 2011a).

Mobile social networks could play an increasing role in job and career counseling

Job counseling platforms like Career Planet and Ummeli, with 14,000 and 64,000 users respectively at the end of 2012, show good user uptake (DG Murray Trust, 2012; Praekelt Foundation, 2012). As mobile Facebook grows in popularity, it may also play an increasingly important role in social networking around jobs and career counseling (Carana Corporation, 2012). Privacy concerns and the fact that some proprietary networks collect information and may sell or otherwise mine youth's information are a concern for some organizations and affect their decisions on which mobile social networks to use.[32] The risks and benefits of using mobile social networks requires further examination.

Gaps in the research on mobiles for employment services

Little is known about the effectiveness of mobile social networks for job seeking and employment services. Job matching and job seeking platforms appear to show success and potential for scale but further study is needed to clarify this.

Potential research questions

- When and where are mobile job matching services effective as stand-alone applications and when are additional programs needed to ensure improved employment impact in the longer term?
- How can employers be incentivized to contribute to job matching so that it can be sustained at scale?
- How effective is mobile job matching for girls and young women and for youth with disabilities in contexts where there are barriers to their entering the job market? Which supplemental programs would be most conducive to helping marginalized groups take full advantage of job and opportunity matching platforms?
- How are youth using mobile social networks such as Facebook to share advice on job seeking with peers? What is the impact on their employment success and why? What privacy concerns might organizations and youth wish to consider when using these platforms?

[32] Discussions during Learning Series 4: Mobiles for Scale and Sustainability in Youth Workforce Development

4) Mobiles for Entrepreneurship and Enterprise Development

Traditionally, most workforce training systems have focused on formal economies. In tight labor markets, however, self-employment may be a more viable option for the livelihood of youth. Entrepreneurial skills constraints on the one hand, and financial capital and social capital constraints on the other, may mean that youth have trouble starting up or running small enterprises or undertaking successful farming activities (The World Bank, 2010).

Youth entrepreneurship and enterprise development programs work to help address these constraints by providing comprehensive support in the form of training,[33] mentoring, networking, business skills development, and financial services for loans and capital (JBS International, 2013).

Mobile technologies are playing a role in entrepreneurship and enterprise development by:

- catalyzing opportunities for youth entrepreneurship in the technology sector via training, incubation, connection, community, and funding;
- enabling youth to access and organize timely and relevant information to support the development and management of small enterprises and farms; and
- helping youth connect with money-making opportunities, and local and global markets.[34]

Table 6: Examples of Mobiles for Entrepreneurship and Enterprise Development Programs

Mobile app development:

- Apps4 Africa (Africa)
- Innovation Hubs and Labs (Africa)

- **Small enterprise information and management:**
- The Organic Farmer (East Africa)
- Lifelines Agriculture (India)
- CocoaLink (Ghana)
- Jigyasha 7676 (Bangladesh)
- Digital Green (India, Africa, S Asia)
- Farmbook (Zambia, Zimbabwe, Madagascar and Malawi)
- iCow (Kenya)
- Acopio (Latin America)
- Tiendatek (Latin America)
- DrumNet (East and Southern Africa)
- mFarm (Kenya)
- IMAC (Niger)
- Esoko (16 African countries)

Connecting to markets:

- CellBazaar (Bangladesh)
- Quickr (India)
- Tradenet (Sri Lanka)
- Mzantsi Prepaid (South Africa)
- iPay (Kenya)

Entrepreneurship and mobile application development

Entrepreneurship within the mobile app and ICT industry is considered an area for potential growth. A number of hubs and labs have sprung up in the past five years, mainly in urban areas, aimed at spurring innovation and entrepreneurship among youth (see Table 6). The World Bank Group's infoDev grant program is supporting both "mLabs" and "mHubs" in eight countries on three continents.[35] mLabs are spaces where mobile application developers can interact, work, and gain access to state-of-the-art tools and expertise to help create viable mobile application businesses. mHubs provide young entrepreneurs with opportunities to network, exchange ideas, receive mentorship, and make connections (Andjelkovic & Eliasz, n.d.).

[33] Also see Section 1 on Workforce Education and Training

[34] The area of youth entrepreneurship and enterprise development is broad and dispersed and the specific role of mobile in youth and workforce development is not always clear. In part, this is because the definition of entrepreneur is not uniform. The terms entrepreneur, small business owner, and informal sector worker are sometimes used interchangeably and sometimes used to describe a very specific type of person or personality.

[35] mLabs operate in Armenia, Kenya, South Africa, and Vietnam and mHubs in Azerbaijan, Georgia, Kenya, Moldova, Nepal, Tanzania, Uganda, and Vietnam.

South Africa's RLabs is a physical space where 18–25 year old youth can participate in training for entrepreneurship, digital technology, social innovation, and leadership. RLabs also supports youth innovators through training, incubation of ideas and applications, connecting young entrepreneurs with each other and potential investors, building a community of innovation, and funding promising applications through its Kukua Fund (RLabs, n.d.).

A popular way to spur competition and ideas in the mobile technology sector is through contests and challenges in which mobile app developers can win funding for creating the applications that judges deem most interesting and viable, with the most potential for scale. Apps4Africa, for example, was launched by the U.S. Department of State in 2010 with a $15,000 prize; by 2012 it was awarding $75,000. Based on feedback from 2012 applicants, the challenge for 2013 will provide additional business development skill-building support to the young innovators.

Box 9. Afrilabs and Africa's Technology and Innovation Hubs Webgathering

Afrilabs is a network of fourteen technology hubs in Africa who work together to promote growth of the technology sector. Each hub has its own mandate, set by its local members based on the local context and the needs of the technology and entrepreneur sector, but working together on joint larger-scale initiatives.

Africa hubs participate in regular live web-based meetings, which are recorded and posted, to share ideas and projects via the Africa's Technology and Innovation Hubs Webgathering site. Topics have included business models, growing the hub model, and ways to increase the engagement of girls and women in the technology sector. The group has also created a crowd-sourced map of the women-led or female-focused technology organizations in Africa as a way of highlighting activities and stimulating more investment in this area.

Small enterprise information and management support

Mobile devices are playing a key role in supporting agricultural extension work. Youth can access information in real-time via mobiles to better manage farms and other small enterprises. Some organizations, such as Esoko, use mobile to send information directly to users. Through this service, farmers can connect directly with prices, bids, weather information, and agricultural tips by subscribing to an SMS alert.

Other extension-type programs like Lifelines Agriculture provide staff or community intermediaries with tools to support outreach and extension work (see Box 10). Digital Green, uses pocket camcorders and micro projectors to help engage farmers in agricultural training to improve farming practices (see Box 11). Many community radios play a strong role in agricultural training in rural areas, and the role of radio in extension work is expanding even further with the expansion of mobile devices (Sullivan, 2011).

Catholic Relief Services has installed the Farmbook tool on laptops and tablets in its programs in four countries to help local staff strengthen their capacity to help farmers manage their farms (see Box 12). Field agents use Farmbook to work through case studies and develop business plans, keep records, and conduct baseline surveys. The tool is also used to track and monitor program activities.

Box 10. Lifelines Agriculture

Lifelines Agriculture in India has amassed information on 460,000 frequently asked questions. LifeLines' field partner, Datamation, is the point of contact for the service, conducting outreach with villagers in over 100 communities to register their queries using an IVR system. For each question received, a knowledge worker searches for an answer in the database and attaches it to the original recording. The user calls in the following day to receive the answer. If an answer does not yet exist, it is forwarded to a team of experts who record one.

Box 11. Digital Green

Digital Green uses pocket video camcorders to record educational agriculture videos. Finished videos are shown to community members using micro projectors. Using a "mediated" approach, a local facilitator engages the audience in discussion and captures feedback. IVR and online/offline web-based data management and analytical tools are also employed by the organization to collect farmer feedback and to measure impact.

Cooperative coffee growers in Latin America are also using mobile devices to better manage their businesses. Acopio provides digital tools and services to collect, manage, and share data along the agricultural value chain. Cooperative members can collect and compare real-time and historical data in order to better understand the quality and quantity of coffee produced over time. Using mobile, growers can tie together various processes, from production to consumption, streamlining information throughout the value chain. In this way, providers of financing are also better able to understand how their lending affects the cooperatives and to manage their risk.

Box 12. Farmbook

Farmbook is a tool used by Catholic Relief Services in Madagascar, Malawi, Zambia, and Zimbabwe to support staff working with farmers to develop business competencies and evaluate productivity and profitability. By collecting information about specific farmers, the CRS staff is able to help them develop tailored business development plans. CRS considers this information to be more relevant and useful than general market data. Farmers are able to keep more complete records of their businesses, improving longer term planning.

Using Farmbook, field agents gain practical knowledge and test their skills using case studies. This allows agents to improve their understanding of the tools and processes farmers use and the challenges they face in developing a business strategy. Farmbook includes record-keeping templates, profitability calculators, market planning tools, and report creation. Agents use Farmbook to take a baseline survey of the community they are working in, and subsequently, to support and track farmers' groups, trainings, asset transfers, profitability analysis, and other business development activities. A mapping solution is being developed to allow CRS field agents to track activities in near real-time. Higher-level managers and agents can then use the information to find links between technology and profitability, or other factors for success within these programs (USAID & University of Illinois at Urbana-Champaign, n.d.).

Connecting directly to markets

Youth are increasingly using mobile platforms to buy and sell goods. Some of these platforms focus mainly on agriculture, and others offer a variety of purchase and sales connections, including want ads for jobs. Point-of-sale devices and applications like Mzantsi Prepaid (see Box 13) are also becoming more popular. These devices allow small business owners and entrepreneurs to sell pre-paid products such as airtime, electricity, and funeral insurance using their mobile phone's USSD functionality, via an Internet-enabled handset or through a device purchased from a point-of-sale vendor.

Box 13. Mzantsi Prepaid

Mzantsi Prepaid allows communities to "shop where they live" by expanding the accessibility of prepaid services in underserved areas. Products are sold through a wireless point-of-sale (POS) terminal.

To become a point-of-sale vendor, a person fills in an application form. Upon approval, they pick up a POS terminal. Upon depositing an initial fund, the POS terminal receives airtime that can be sold immediately. POS terminals can open opportunities for youth to start small businesses as well as for clients to access services previously unavailable.

A more sophisticated tool that functions on a tablet or smartphone is Tiendatek, which allows storeowners to manage a range of activities from electronic payments to stock, clients, suppliers, expenditures, finances, and more. Buying and selling platforms and point-of-sale tools can allow youth to connect locally and do business in previously inaccessible markets.

Research findings on mobiles and youth entrepreneurship and enterprise development

Initial research shows opportunity and growth promise for entrepreneurship in the mobile technology sector. Further research is underway that may help qualify what kinds of activities and environments provide the best support for young entrepreneurs and app developers. The use of mobiles and other ICTs in the area of agricultural development is likewise an area of interest to many. Though it is quite well documented, it lacks a specific focus on youth. The research on entrepreneurship and enterprise development highlights a strong gender gap that needs to be better understood and addressed.

"Entrepreneurship is a possibility. There is actually not much other choice than creating your own job. But many youth don't have financial skills or an understanding of how entrepreneurship works."

Lauren Kotze, Ummeli

Lessons learned

Mobile apps and technology innovation are an area for growth and development

Support for youth entrepreneurship in the technology industry is growing. A World Bank report on Mobile Entrepreneurship and Employment notes that faster mobile networks and more smartphones make mobile communications a platform for innovation in various sectors. Mobile can serve as a tool for contacting customers, accessing the Internet, making financial transactions, establishing a client database, coordinating supply chain deliveries, and enabling small businesses to operate and grow in places where accessing markets and selling new products would otherwise be impossible. Mobile software applications are considered one of the most promising areas for entrepreneurship, given the generally low barriers to market entry for individual developers and the innovation spaces and hubs that can help to spur this sector (Andjelkovic & Imaizumi, 2012).

Youth entrepreneurship and innovation programs need to go beyond mobile app development

Critics believe that the focus on app development, incubation, and app contests is shortsighted. They note that youth require support in a number of soft skills areas—mentorship, writing, management, and business development skills—in order to take mobile app development forward in a way that leads to a sustainable business.[36]

A series of studies by iHub Nairobi have been examining the role of innovation hubs in supporting entrepreneurship over the next three years. The first study found that iHub Nairobi has been a supportive co-working space that facilitates networking, collaboration, partnerships, skill sharing, and knowledge acquisition. Many member entrepreneurs, who had graduated from school without formal job opportunities, felt that their talents and skills had been recognized and nurtured within the hub. These member entrepreneurs reported the challenges in their start-up businesses, most of which are related to mobile applications: (a) funding and access to capital, (b) capacity for sustained growth, (c)

[36] Marieme Jamme, key informant interview, February 2013.

Photo: Sophie Namy

> *"I tell youth, 'don't tell me about your start-up, tell me how you are going to sustain it. How you are going to market it. You don't even have a business if all you have is an app….' Youth need skill building, workforce development. They need to learn basic things like writing a website or a project and doing a presentation."*
>
> **Marieme Jamme**, CEO SpotOne Global Solutions
> Founder of JJiguene Tech Senegal and Africa Gathering

finding the right mentors, (d) needing a better understanding of pricing models for their products, (e) competition with larger for-profits like Google and Safaricom, and (f) the tendency to rely on conjecture rather than market research or feasibility-viability studies (Moraa & Mwangi, 2012). The second study in the iHub research effort looked at the operating model of ActivSpaces, a hub in Cameroon. The challenges described in this study included poor Internet infrastructure, low capacity to run the space, difficulty attracting and managing hub members, lack of seed capital, and lack of direct mentorship and counseling (Moraa & Murage, 2012).

Opportunities exist for developing the mobiles and agriculture space

Much recent attention has been placed on the role of mobiles in agriculture, though this is not usually framed as an arena of workforce development and it does not have a youth focus. An industry report from 2011 outlines a range of possibilities for mobile in agriculture, including financial services tailored for agricultural purposes, mobile information platforms and farmer helplines, optimized supply chain management tools, and enhanced buying-selling platforms. The authors consider mobile network operators catalysts for action due to their technology, distribution channels, and customer

relationships, and urge NGOs, private enterprises, and governments to contribute their knowledge and expertise in order to ensure the delivery of the benefits to their full potential (Accenture & Vodafone Group Plc, 2011).

"We need to go back and think about what we've done on mobile technology in Africa…. There are thousands of start-ups but they are not giving a positive return because we need an ecosystem. We've failed because we are not giving people long-term training and support. Instead we are throwing everything on a fast track. We are giving people ready-made incubators rather than teaching them how to develop a sustainable business."

Marieme Jamme,
CEO SpotOne Global Solutions, Founder of JJiguene Tech Senegal and Africa Gathering

A more intentional focus on youth, mobiles, and agricultural development would be helpful

Two major initiatives bring together a large base of evidence and examples on how ICTs, including mobile devices, are changing rural agricultural work. The Fostering Agriculture Competitiveness Employing Information Communication Technologies (FACET) initiative, supported by USAID and implemented by FHI360, has developed an extensive catalog of materials and research on ICT for agriculture. The World Bank's ICT in Agriculture e-Sourcebook notes that hundreds of agriculture-specific applications are now emerging and showing great promise for smallholders. The 400-page sourcebook contains over 200 project-based case studies and examples of how ICTs are used along the agriculture value chain (The World Bank, 2011). Neither of these initiatives, however, has a strong focus on youth. A third initiative, Young Professionals in Agricultural Research for Development (yPARD), operates as a network and a global online and offline communication and discussion platform whose aim is to enable youth to bring in new ideas that lead to more dynamic agricultural research for development. The yPARD platform also offers a large resource base, including some content on mobile technologies in agriculture. The new Technology4Agri is another source of agricultural and technology information for young people.

Mobiles can expand the effectiveness of radio for extension work

Radio continues to be an extremely important tool for education and training in agriculture , especially in rural areas. Research conducted by the African Farm Radio Research Initiative provides insight into how mobile is changing rural radio. It found that new low-cost ICTs like mobile phones, MP3 recorders and players, and IVR dramatically increased the capacity of rural radio to help farmers improve food security in Sub-Saharan Africa. The use of ICTs made radio programming more accurate, timely, and accessible to farmer listeners. Use of SMS to alert farmers of upcoming programs increased overall listenership. Call-in and call-out capacities allowed farmers to participate in live broadcasts and shape on-air discussions. Internet access made it possible for local radio station staff to research different topics

Box 14. Mkulima Young

Mkulima Young uses radio and ICTs to encourage youth to see agricultural activities in a positive light. It identifies youth engaged in outstanding agricultural entrepreneurial activities and disseminates these ideas through radio and Facebook. An SMS feedback system is paired with radio programs, allowing regular feedback from target listeners to shape the programming. The project teaches youth about the economic benefits and potential of agriculture activities and motivates them to try new agriculture techniques and practices. On the project's Facebook page, "Mkulima Young," youth ask questions, share advice and buy and sell products and services. The page has over 11,000 "likes" and can be accessed via mobile phone. By using a preexisting framework – e.g. Facebook – the cost is kept low, and no extra training is needed to show youth how to take advantage of the site.

Photo: Paul Kim, SMILE

Only 16 percent of iHub's 7,000+ members are female (Moraa & Mwangi, 2012).

for radio programs. Portable voice recorders allowed radio hosts to interview farmers in their fields and homes and allowed farmers to listen to previously broadcast shows when they had time (Sullivan, 2011). Like other studies, this one emphasizes that technology alone is not sufficient: (a) technology must be integrated with appropriate training in use and maintenance of equipment, and (b) broadcasters need to find sustainable ways to fund and own the technology. The Mkulima Young program uses a combination of tools to reach out to youth to encourage farming, including radio and Facebook (see Box 14).

Gaps in the research on entrepreneurship and enterprise development

The research on mobiles for entrepreneurship and enterprise development is very broad and interspersed throughout the literature in many different sectors, making it difficult to consolidate, analyze, and draw conclusions.

Potential research questions

- What skills and other support would best equip young people to sustainably launch, market, and manage mobile applications and other innovations? Are there existing programs that are supporting youth to develop those skills? What can be learned?
- What kinds of ICTs, if any, are best suited to reach rural youth working in the agriculture sector and for what purposes? How can youth specifically, as opposed to older farmers, use mobile devices to improve farming or related enterprises?
- How are youth using commercial buying, selling, and point-of-sale applications to access the market in ways that were not possible before the advent of mobile? Which are most effective, in what circumstances, and at what scale?
- What can be done to involve more girls and young women in entrepreneurship and enterprise development? Are there efforts that are working? Are there ways that mobile can support mentoring and encouraging young female entrepreneurs?

5) Reducing Social Constraints to Employment with the Support of Mobiles

Social norms and local customs can deter certain groups from participating in youth workforce development programs and the labor market. For example, people living in rural areas or from certain ethnic groups or classes may not aspire to particular jobs because of cultural traditions. Families, communities, and society may send the message that a particular job is only suitable for males or females, placing barriers on certain occupations (The World Bank, 2010). Youth living with a disability may be excluded from all areas of youth workforce development. Discrimination that starts with exclusion from basic education can also include discrimination by employers. People may believe that persons with a disability cannot or should not work. These beliefs are often internalized, making it difficult for excluded groups to move forward with efforts to participate in youth workforce development programs, job seeking, and work.

The World Bank (2010) found that youth workforce development programs that focus on overcoming social constraints might include:

- Supporting effective participation of excluded groups in youth workforce development programs;
- Providing non-traditional skills training;
- Ensuring safe training and employment spaces for excluded groups;
- Adjusting program content and design to account for specific needs of excluded groups;
- Mobiles are being used to help overcome social constraints by enabling:
  - alternative, non-traditional mentoring, training, and work opportunities and locations for excluded groups, and
  - access to jobs for people living with disabilities.

Table 7: Examples of Mobiles and Social Norms Programming

Mentoring, training and work opportunities:

- Girls who Code (US)
- Akira Chix (Kenya)
- Jjiguene Tech Hub (Senegal)
- Digital Divide Data (Cambodia)
- Samasource (global)
- Souktel (22 countries)

Enabling access to jobs and job tools:

- Computer Aid
- Sight Savers
- Telecentre.org

Behavior Change Campaigns:

- mWomen (global)
- Girls in ICTs Day (global)
- Tech Needs Girls
- Carana
- Telecenter.org

Some organizations and coalitions are also carrying out broader attitude and behavior change campaigns aimed at opening societal and individual attitudes to the involvement of excluded groups in the labor market and in non-traditional employment fields such as ICTs.

Enabling alternative, non-traditional mentoring, training, and work opportunities

Excluded groups often need to be explicitly targeted for workforce development and training. They may need to develop self-esteem and other soft skills to improve their self-image or open up their thinking to the kinds of jobs they could attain or their capacity for self-employment. Some mobiles and youth workforce development programs focus specifically on engaging marginalized groups, such as poor youth, rural youth, youth with disabilities, or girls and young women. Mobile may be able to help reach past social constraints to enable excluded youth to connect with and take advantage of opportunities.

Mentoring, for example, has been shown to be of particular importance to support girls and young women during workforce development or entrepreneurship training, and to help them enter the job market (EQUIP3, 2012a, 2012b). Organizations that work to engage more girls and women in the mobile and technology sector include Akira Chix, a Kenyan organization that trains, mentors, and supports girls in technology (see Box 15) and Jjiguene Tech Hub, which aims to be the first women's technology hub in Senegal.[37]

The US-based initiative, Girls who Code, works to help girls realize that "you don't have to be Mark Zuckerberg" to get involved in the ICT industry as a coder or application developer.[38] With the support of several corporate, foundation, and technology partners, the organization combines intensive instruction in robotics, web design, and mobile development with high-touch mentoring and exposure, led by the industry's top female engineers and entrepreneurs. The program works primarily with girls who are first generation immigrants in New York City and plans to expand to Detroit, San Francisco, and San Jose in 2013.

Box 15. Akira Chix

Akira Chix strives to engage more girls and women in the mobile sector in the developing world. The organization conducts a training program to inspire girls from poor urban communities, giving them the skills they need to find a career in the ICT field. Skills taught range from basic computer skills to programming and design. Training also includes skills on entrepreneurship and business development. Akira Chix also started the Mobile Garage, a hub for connecting mobile developers in Kenya.

Through mobile devices, organizations may be able to connect with girls and young women in circumstances where religious or cultural traditions keep them at home, and with youth whose disabilities limit their movement. Youth with limited mobility, for example, may be able to participate in education and training, complete microtasks, and seek jobs using mobiles. These programs, however, also require additional corollary elements that address the broader social constraints facing participants.

Enabling access to jobs and job tools through assistive technologies

Information and communication technologies, particularly assistive technologies (ATs), can allow youth with disabilities to access traditionally unavailable educational content through electronic and online learning channels. Connected, accessible schools are sometimes leveraged as community ICT centers where job-skills training and employment opportunities for youth and adults with disabilities are created. The organization Telecentre.org notes that community telecenters are a growing area for employment for persons with a disability (International Telecommunication Union, 2013).

[37] Marieme Jamme, key informant interview, February, 2013.

[38] Notes from the Technology Salon/Learning Series 3 event, "How can mobile technologies support workforce development programs with girls and young women," March 15, 2013.

Supporting broad-based behavior change campaigns

Alongside targeted programs and tools to help excluded populations to access and participate in YWD programs, wider campaigns can support changes in the individual and societal attitudes that restrict these groups' participation. mWomen is a global campaign supported by the GSMA that advocates at various levels for women and girls to have access to mobile phones. The International Telecommunications Union's (ITU) "Girls in ICT Day" initiative encourages more girls to enter the technology workforce. These campaigns can help change mindsets and open opportunities.

Accessible ICTs are a full range of assistive and mainstream technologies and formats that can enable a student with a disability to enjoy an inclusive education.

Assistive technology (AT) is a "piece of equipment, product system, hardware, software or service that is used to increase, maintain or improve functional capabilities of individuals with disabilities" (ISO & IEC, 2001).

Research on mobile technologies in addressing social constraints

The role of mobiles in helping overcome social constraints is not well researched or explored, and the same constraints that hold certain groups back from participating in workforce development programs likely reduce their access to and use of mobile devices. Focused and thoughtful programming may be able to help overcome self-imposed stigma and external social constraints, and help improve opportunities for excluded youth. Very little research exists in this area and most projects and programs are in their very early stages.

Lessons learned

Girls and young women need additional support to take advantage of mYWD opportunities

Girls and women are at a double disadvantage because of the social norms that both inhibit their participation in the labor market and impede their access and use of ICTs. For this reason it is important that mYWD programs include a gender lens throughout the program cycle in an effort to ensure that girls and young women can take better advantage of mYWD opportunities. A 2011 study of gender norms related to technology in poor urban and rural communities in Malawi and Ethiopia, noted and confirmed through observation, that the relationship between technology and masculinity is well established. Earphones and small radios, for example, were considered "toys for boys" and girls who used earphones were ridiculed (Geldof & Holloway, 2011). This is in line with studies cited above on the barriers that girls and women face in access and use of ICTs (EQUIP3, 2012b; International Youth Foundation, 2012; Plan, 2010; Cherie Blair Foundation for Women & GSMA Development Fund, 2010). When designing

Box 16. Sightsaver Dolphin

Sightsavers International and Computer Aid International worked with the UK-based assistive technology (AT) developer Dolphin and the Kenya Union of the Blind to give 45 refurbished laptops and AT software to 45 blind students at Kenyatta University in Nairobi. The Sightsaver Dolphin pen drive contains software that produces synthesized speech output of screen contents for blind users. It also provides screen magnification and enhancements for visually impaired users. The pen drive can be used on any PC, reducing the cost of maintaining multiple software licenses on multiple machines (International Telecommunication Union, 2013).

technology-aided initiatives for a group of rural women in India, one study found that it was important to keep in mind the user's readiness to engage with mobile devices and her willingness to include her entire family (Shroff & Kam, 2011).

Technology training helps youth with disabilities feel more empowered to enter the labor market

A report by TASCHA on technology, disability, and employability notes that condescension by potential employers and the idea that disabled youth will not be able to complete assigned tasks become issues for disabled persons entering the labor market. Respondents in the study believed that computer centers helped reduce stigma: Participation in the labor market enhanced the visibility of people with disabilities in new occupations and helped replace stereotypes about the kinds of jobs that people with disabilities could do. One fifth of the study respondents said that technology training could play a role in reducing the stigma of a disability because it provided a "transition to normalcy" where people with disabilities perform the same tasks on computers as people without disabilities (Pal et al., 2009). Advances in mobile assistive technologies may offer increased opportunities to help people with disabilities gain new skills and new confidence for entering the labor market.

Gaps in the research on mobiles and social constraints programming

A major gap in the research in general is the lack of gender and age disaggregated data in relation to mYWD, including data related to use and access to mobile devices in developing countries and participation in various not-for-profit and for-profit initiatives or services. There is also practically no research on how mobile devices or the mobile industry could support YWD opportunities for youth with disabilities. Many of the efforts in these areas that are linked to mobile or the mobile industry are in early or speculative stages and there is little solid evidence. Most projects identified in the literature review are just beginning.

Potential research questions

- What examples exist of social norms programming having a concrete impact on the rates at which girls, young women, youth with disabilities, and other excluded groups enter the labor market or build sustainable livelihoods? Are there examples and contexts where mobile devices are playing a role? Where can mobile support these programs?
- What new opportunities does mobile offer to excluded groups? Does mobile offer different opportunities than desktop computers and telecenters?
- Are broad campaigns effective in changing mindsets and behaviors of families, communities, employers, and societies? What more can be done in this area?
- What policies would help to mandate inclusion of excluded groups in workforce development activities?

V. Scale and Sustainability in mYWD

The challenge of youth unemployment is an enormous one that requires partnerships and support from various stakeholders, including youth, the education system, the private sector, the mobile industry and the broader technology industry, private training institutions, social enterprises, government, and the non-profit sector. Mobile devices have been identified as tools that can support youth workforce development because: (a) they are ubiquitous; (b) they help people access, produce, transfer, and collect information; and (c) they help people connect, communicate, and conduct various kinds of transactions. If the full potential of youth workforce development programming is to be achieved, people working in the mYWD field need to think systematically about scale from two angles: (a) how can mobiles help existing successful youth workforce development programs reach scale, and (b) how can innovative new mYWD programs be sure to consider scale and sustainability from the outset?

Scale can be defined as "expanding, replicating, adapting and sustaining successful policies, programs or projects in different places and over time to reach a greater number of people" (The World Bank, 2004). A useful framework for considering scale in mYWD programs is the Hartmann & Linn (2008) framework, which establishes a three phase scaling up process:

- *Innovation phase* — A new idea, model, or approach is embedded in a pilot project. In this phase, the project on its own has limited impact. The important point is that new ideas are tested and tried in order to discover what works. Not all attempts at innovation will scale and not all will be sustainable, but in Linn's model, this is a normal outcome. Failure should be accepted as an integral part of innovation and learning.
- *Learning phase* — The experience with the innovation is monitored and evaluated, and a knowledge management process makes it possible to share the lessons. The learning process is extremely important in countering two common errors that can occur in programs: (a) not enough attention is placed on scaling up, a program comes to an end, and it simply shuts down with limited impact; or (b) scaling up is done the wrong way because of insufficient piloting, testing, and learning, or inappropriate timing or phasing of the approach.
- *Scaling up phase* — The idea, model, or approach is brought to scale, drawing on the knowledge generated during the pilot and learning phases.

Monitoring and evaluation are critical in the Hartmann & Linn model of scaling up, so that organizations and innovators do not miss opportunities for scale or make poor decisions due to lack of timely and relevant information. The authors note several common errors: (a) creating boutique approaches that only work on a small scale; (b) creating parallel or special purpose entities that bypass existing structures, such as government ministries; (c) working with limited financing mechanisms; (d) failing to identify policy constraints; and (e) working with small implementing partners who limit scaling up potential.

Hystra (2011) looked at business models in four sectors of ICT4D (education, health, finance, and agriculture) to better understand common barriers to scale and financial sustainability of ICT4D projects. The authors screened 280 projects and selected 116 for an in-depth analysis of their business models. Over half the 280 projects were still young or not financially sustainable. The authors noted that in the field of ICT4D, projects reaching the "million customer landmark" are the exception and it is still too early to speak about results in a definitive manner. They make three recommendations

for a market-based approach that would support scale and financial sustainability: (a) focusing on a problem-driven approach for sustainable projects to emerge out of myriad existing trials; (b) supporting existing entrepreneurs, promoting synergies, and removing barriers to scale; and (c) creating a systemic environment for cross-border replication. The study suggests that governments and institutional development agencies should work on setting up new regional sharing platforms or support the ones already in existence.

A study by the GSMA's Mobile Development Initiative identified over 800 live mobile-enabled products and services in the developing world and found that barriers to scale are multi-faceted and driven by factors related both to individual organizations and to the sector as a whole. It noted that the greatest enablers for scale are the presence of defined value chains, sustainable business models, and market visibility. The report distinguishes platforms, frameworks, and so-called "bespoke" services. Platforms, such as Linux, iOS, and Android are generic and able to accommodate a range of applications or services. Frameworks, such as Fundamo and Frontline SMS, are less generic than platforms, but still provide reusable tools for others to use in mobiles for development (M4D) services. Bespoke M4D services are the least generic and are generally designed for one sector in one country. The study found that in the M4D sector, bespoke services are the most common, followed by frameworks. Applications built on true platforms, which are controlled by global technology, media, and telecommunications firms (with or without direct interest in the M4D space) were rare. The report concludes that in order to reach scale, M4D initiatives should be built on platforms rather than created as bespoke applications for specific projects (which is most often the case at present) (GSMA Mobile and Development Intelligence, 2013).

"Bespoke" services are applications designed for a specific project and do not have universal functionality.

As evident from the range of projects and initiatives compiled in this landscape review, mYWD is a burgeoning field with myriad innovations and approaches of all types, sizes, and stages, from early-stage, app-based start-ups that cover one area of YWD, to holistic programs, industry efforts, and advocacy programs that address the root causes of youth exclusion and unemployment. Some organizations are integrating mobile into their existing workforce development programs. New organizations or social enterprises are just starting in the area of YWD with mobile-based initiatives.

None of the efforts identified for the landscape review has reached a true point of scale up. For a field in its infancy, with many programs and initiatives in the early stages of piloting and innovation, and only a slim evidence base on what is working, where, and why, it is necessarily unclear which efforts will flourish and which will not.

In a process of innovation, learning, and scale, the fact that not every new mYWD program will scale up is to be expected. The important thing is that new ideas be tested and learned from, so that what works will eventually become clear. At this point in time in the emergence of mYWD, it is important to encourage the cycle of innovation and learning, incentivizing and supporting organizations and implementers to think about scale in a systematic way. The current review has mapped out a wide range of initiatives and it will be vitally important to create spaces for widely sharing all of this new knowledge about successes, failures, and ways forward.

VI. Key Findings and Recommendations

An enormous amount of activity and a wide range of initiatives are animating the mobiles for youth workforce development space, from small-scale, market-based start-up applications to multi-million dollar holistic programming, industry efforts, and mobile innovation hubs for youth entrepreneurs. The field of mYWD is young and only just beginning to coalesce. Most projects, programs, and initiatives are in their early stages of innovation and learning, and thus there are too few reliably documented, rigorously analyzed, and sufficiently generalizable findings to permit conclusions on which initiatives are successful or which recommendations are reliable for investment in any particular approach, concept, or type of program.

The evidence base for YWD programming is still being developed and evidence on the specific role and impact of mobiles in YWD programs is even less well established. For this reason, the viability of the majority of the initiatives identified for the review has yet to be demonstrated. The connection between the potential of mobile devices to support youth workforce development and youth employability and their actual role and impact has not been adequately explored. In most cases, the potential for sustainability and scale is still being worked out.

Although there was little solid evidence to be found specifically about mYWD, some findings can be highlighted to guide future mYWD efforts and exploration.

Workforce education and training

There is a wide and exciting range of experimentation and programming in this area. Youth are using mobile to discover and access relevant education and training content. Staff, teachers, and trainers are using different types of mobile devices to access and create more interesting and updated curricula and content.

Photo: Paul Kim, SMILE

In addition, mobiles are enabling real-time measurement of student efforts, progress, and results, allowing for better tracking and timely adjustments to methodologies and approaches that improve program quality.

Young people are hungry for youth workforce education and training and see mobile devices as a way to access opportunities previously unavailable to them. The field is still developing and opportunities for new partnerships and new players are wide open. More documentation and evidence is needed to help determine which approaches and programs hold the most potential for the greatest impact on learning and skill development. Little is known about which models and types of programs might be the most sustainable or scalable with the most quality and impact.

Key findings:

- Understanding how youth access information across different devices and designing content that can be accessed from different devices is more appropriate than designing strictly for one kind of mobile device. Information on cost and levels of access need to be considered, especially for more marginalized populations, such as rural youth and young women.
- Educational media for instruction should be selected based on the ability to deliver a desired educational technique to the intended location at the most appropriate moment. Blended learning approaches, where the device or digital content supports a teacher or facilitator in engaging learners in interactive learning, show better outcomes. Not enough is known, however, about which characteristics of blended learning or in which contexts blended learning models lead to more beneficial outcomes.
- Self-directed learning, where the learner follows along with digital content at his or her own pace, was shown in two studies to be effective with advanced students and learners who already excel in the classroom, but is not suitable for weaker students.
- Practitioners recommended designing for the lowest common denominator mobile technology—SMS—in order to reach the greatest number of users. SMS, however, is not conducive to teaching and learning more complex hard and soft skills. SMS was effective in three studies for literacy retention and in two studies for behavior reinforcement of simpler tasks and learning, such as hand washing.
- Use of mobile devices during program implementation to collect information on user behaviors and skills acquisition can help program managers adjust their activities and approaches as they go, to better serve participants and to help build an expanding evidence base.

Demand-side programs and policies

The majority of youth workforce development programs target the supply-side (preparing youth for jobs) rather than the demand-side (job creation). Yet while the mobile industry is identified as a high-growth industry, few programs were identified that specifically work to create demand for youth labor in the mobile or mobile-related industry. New kinds of jobs for which youth may be especially well suited do seem to be arising in the expanding information economy, including microwork and infomediary jobs, but there is little evidence yet about the impact of these efforts. Some large-scale government programs use mobile money to provide subsidies for vocational training and small business grants, and mobiles are being used to support easier management, tracking, and cost-effective distribution of these subsidies. Mobile devices are also being used to collect user feedback about program quality.

Key findings:

- There is anecdotal evidence that microtasking helps youth build skills and that it often leads to better employment and earnings in the medium term. Only the simplest tasks can be completed

on a mobile phone, however, in contrast with PC- or tablet-based microtasking. One study recommended that micro-work should only be considered in contexts where earnings are competitive and it is compatible with local skills and language. Care needs to be taken that micro-work does not exploit workers when it is not yet covered by labor laws.

- Impact Sourcing (IS)—an approach that encourages large-scale industries to source and train employees from low-resource, marginalized communities for certain administrative jobs—has been paired with micro-tasking to help create employment opportunities for disadvantaged youth in business process outsourcing (BPO) companies. Challenges have included engaging BPOs in the social mission of Impact Sourcing and company concerns about potential public relations crises in countries where job outsourcing is a sensitive topic, such as the United States. IS opportunities will be expanding to more digital and technology-related industries.
- A large-scale unconditional cash grant program in Uganda aimed at stimulating local enterprise reported that participating youths' incomes still showed an increase of 41 percent four years after the program ended. Cash grants may be one way of stimulating youth livelihoods in rural areas and mobile money transfers may be a payment option for these kinds of cash grant programs.

Employment services

In many cases youth are unable to find work because they lack information about available jobs and are unable to communicate their skills and availability to potential employers. Youth and employers are connecting through mobile job matching-job seeking apps. In addition, youth are using mobile devices to discover and access employment services, jobs, internships, and other workforce development opportunities. Through mobile social networks, they are sharing advice and tips on job seeking and interviewing. Job matching-job seeking is growing quickly as many commercial online job services are moving to mobile.

Key findings:

- In one study, youth reported saving time and money by using mobile job seeking-job matching applications instead of searching want ads in newspapers, going door-to-door, or waiting for an opportunity to appear. When combined with skills training in situations where there is a labor market for youth, mobile job matching can succeed in placing youth in jobs. Job matching systems are beginning to scale in country coverage, the numbers of youth using them, and the number of employers posting jobs.
- Practitioners note that job matching alone is not enough for young women or youth with disabilities who may lack confidence or may not be allowed to accept a job or other opportunity because of cultural barriers or restrictions on their time and mobility.
- Because mobile social networks such as Facebook are becoming increasingly popular with youth, these platforms may be useful spaces for organizations to offer career counseling and other employment services. Privacy policies of different networks need to be better understood in order to make decisions about their suitability for use with youth programs.
- The role of mobiles in certification and efforts to certify mobile-based education and training are in their infancy and are not developed enough to support any conclusions.

Entrepreneurship and enterprise development

This area encompasses a wide range activities, from formal and informal self-employment to agricultural development and livelihoods. Much is happening in this area. Young people are connecting with entrepreneurship and enterprise training and support opportunities through innovation hubs and labs. The ability to quickly access information through mobile devices is helping youth start up and develop small enterprises, informal job activities, and agricultural work. Opportunities to acquire tools, skills, and

funding for small enterprises are being generated through the mobile industry, related side industries, and innovation hubs. This is opening up ways for youth to overcome business start-up constraints. Youth are using mobile devices to buy and sell directly to both local and global markets and mobile applications that support business management are enabling youth to run small enterprises more effectively.

Key findings:

- A small-scale study of one innovation hub found that it was valued by youth as a supportive and nurturing space for developing mobile applications, networking, and collaboration. Researchers and practitioners have pointed out, however, that in order for these spaces to help youth in the long-term, they need to include (a) support for soft skills that go beyond simple app development and app-related challenges; and (b) the business development, writing, marketing, user-centered design, and financial management training that helps youth build transferable skills and create more sustainable enterprises.
- Mentoring is a critical element in successful entrepreneurship and business development efforts, especially for girls and young women, who are seriously underrepresented in the technology field.
- Point-of-sale tools, which allow small business owners to sell pre-paid products such as airtime and electricity via a mobile device, may be an area to explore as they can open up opportunities for young entrepreneurs and small enterprises to access previously unavailable local and global markets.

Overcoming social constraints

A number of social constraints to employability still exist, especially for young women and youth living with disabilities. Holistic mYWD programs that support youth individually and address larger social and cultural barriers that exclude certain youth from finding and accessing meaningful jobs are working to change negative attitudes and behaviors. Awareness campaigns that encourage girls and young women to consider jobs in the technology sector are working to change negative attitudes about girls' capacities and aptitudes in non-traditional fields. In addition, steps are being taken to ensure more inclusive programming and targeted outreach to youth who are marginalized due to disability. Mobile devices are playing a role in supporting effective participation of excluded groups by enabling alternative and non-traditional mentoring, training, and work opportunities.

Key findings:

- Because girls and young women have less access to ICTs and to education, training, and employment, initiatives should be designed from the beginning with gender inclusivity in mind. Both research and practice highlight the inability of devices alone to overcome the cultural and social barriers that girls and young women face related to workforce development and employment.
- A range of mainstream and assistive technologies and formats are available that can enable persons with disabilities to be included in education and workforce activities, and to access information and communicate via mobile devices. Teachers and instructors need to be trained and encouraged to feel more confident and capable of working with these technologies and with persons with disabilities. Employers need to be supported in changing their attitudes and equipping their workplaces so that people with disabilities can enter the labor force.
- Societal attitudes that people with disabilities cannot or should not be educated or work need to be overcome. When youth with disabilities participate in job training and become visible members of the labor force, stigma is reduced because of their enhanced visibility in new occupations. This helps reduce stereotypes about the kinds of jobs that people with disabilities can do.

Recommendations

Making definitive recommendations about the state of mYWD is difficult for a relatively new field with a limited research base. Viewed through the three-phase lens of innovation, learning, and scale, it is clear that most mYWD initiatives are still in an innovation phase and a few are moving into a learning phase. The most valuable next steps to take will be to actively encourage the existing cycle of innovation and testing, and to encourage and incentivize processes of learning, knowledge sharing, and more systematic thinking about scale.

To advance the mYWD field, further development of the evidence base is required for a firmer understanding of (a) which initiatives or parts of initiatives show promise, and (b) what thinking and planning will make it feasible for them to move towards scale.

Initial steps could include:

1. **Discussion and agreements about mYWD terms, definitions, and types of programs**
   The current landscape review could serve as a starting point for discussing and defining a common understanding of mYWD and the different types of mYWD programming. Once a better understanding of the whole mYWD field is reached, it will be useful to define a set of indicators corresponding to the different types of programming in order to better understand what might constitute success in each area. Indicators could be related to overcoming the key constraints that mYWD programs aim to address.

2. **Further development of the evidence base for mYWD**
   Because mYWD programs are still in their infancy, impact evaluation may not be possible. Nevertheless, full documentation of what is known about what works, where, when, and why, and how to design more effective mYWD programs, is all the more critical to help guide the field. Better use of mobile devices for data gathering should be encouraged to promote both monitoring of efforts and user feedback on the various initiatives. It is essential that all data collection be disaggregated by age and sex.

3. **A better understanding of what scale means for mYWD**
   Given the range of approaches, program types, and actors, further discussion is required about what quality programs would look like at scale, which programs can effectively reach scale in which contexts, and what roles are required of different actors. Better understanding is required on three fronts: (a) where and how mobile technology can help existing youth workforce development programs achieve scale, (b) how mYWD programs can reach scale, and (c) what government policies can support mYWD scale and need to be part of a stronger policy agenda.

4. **A priority focus on girls and young women, and a gender lens in programming**
   The low levels of participation of girls and young women makes a focus on them critical in virtually every aspect of mWYD: mobile access, education and training enrollment and completion, employment, involvement in entrepreneurship and technology, recognition in the agriculture and small enterprise sector, and demand-side policy development and decision making.

5. **A focus on the inclusion of youth with disabilities in programming**
   Youth with disabilities are among the populations facing the most discrimination in education, training,

Photo: Sophie Namy, International Center for Research on Women

hiring practices, and social inclusion. Inclusive ICTs and assistive technologies should be further explored and developed, and a priority should be placed on both inclusive and targeted programs that reach out to youth with disabilities.

6. Knowledge sharing and collaboration

A strong and active effort for knowledge sharing and collaboration among different sectors would contribute to achieving these recommendations. Including existing research and mapping programs, projects, solutions, and service providers on a new or existing portal would be helpful. The mYWD Working Group can play a key role in furthering the discussion of a framework for mYWD and the development of indicators. A community of practice and better knowledge sharing could help to ensure the widest possible discussion and agreement about successes, failures, and good practices.

7. Further research and exploration

In addition to the specific research questions outlined throughout this report, research is needed on the conditions, partnerships, and models required for scaling up mYWD programs.

References

Accenture, & Vodafone Group Plc. (2011). *Connected agriculture: The role of mobile in driving efficiency and sustainability in the food and agriculture value chain*. Retrieved from http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-Connected-Agriculture.pdf

African Medical and Research Foundation. (2011). *Report on evaluation of the utilisation of competencies gained from the Kenya Nurse Upgrading Programme*. Nairobi, Kenya: Author.

African Union. (2009). *African Youth Charter*. Addis Ababa, Ethiopia: Author. Retrieved from http://www.africa-union.org/root/ua/conferences/mai/hrst/charter english.pdf

Aker, J. C., Boumnijel, R., Mcclelland, A., & Tierney, N. (2012). *Zap it to me : The impacts of a mobile cash transfer program*. Retrieved from https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=CSAE2012&paper_id=269

Aker, J. C., Ksoll, C., & Lybbert, T. J. (2010). *ABC, 123: The impact of a mobile phone literacy program on educational outcomes* (Working Paper 223). Washington, DC: Center for Global Development. Retrieved from http://www.cgdev.org/files/1424423_file_Aker_Mobile_Phone_Literacy_FINAL.pdf

Andjelkovic, M., & Eliasz, T. (n.d.). *Mobile applications: Creating sustainable businesses in the knowledge economy* [Flyer]. Washington, DC: infoDev. Retrieved from http://files.kotisivukone.com/entre.kotisivukone.com/tiedostot/mlabs.pdf

Andjelkovic, M., & Imaizumi, S. (2012). Mobile entrepreneurship and employment. In World Bank (Eds.), *Information and communications for development 2012: Maximizing mobiles* (pp. 75–86). Washington, DC: World Bank. Retrieved from http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/IC4D-2012-Chapter-5.pdf

Bachan, K., & Raftree, L. (2011). *Integrating information and communication technologies into communication for development strategies to support and empower marginalized adolescent girls* [Final draft]. New York: UNICEF. Retrieved from http://c4d.undg.org/files/integrating-icts-c4d-strategies-draft-09-nov-2011

Beltramo, T., & Levine, D. (2010). *Do SMS text messaging and SMS community forums improve outcomes of adult and adolescent literacy programs? Evidence from the Jokko Initiative in Senegal* [Working Paper]. Berkeley, CA: Center for Effective Global Action. Retrieved from http://www.escholarship.org/uc/item/1c31c2m4#page-2

Blattman, C., Fiala, N., & Martinez, S. (2011, December). *Employment generation in rural Africa: Mid-term results from an experimental evaluation of the Youth Opportunities Program in northern Uganda*. New Haven, CT: Innovations for Poverty Action (IPA). Retrieved from https://www.poverty-action.org/sites/default/files/blattmanfialamartinez.midtermreport.pdf

Blattman, C., Fiala, N., & Martinez, S. (2013, May 20). *Credit constraints, occupational choice, and the process of develoment: Long run evidence from cash transfers in Uganda*. Retrieved from https://www.poverty-action.org/sites/default/files/ipa_0189_uganda_youth_opportunities.pdf

Bluestone, J., Johnson, P., Fullerton, J., Carr, C., Alderman, J., & BonTempo, J. (2012). *Effective in-service training techniques, timing, setting and media: Findings from a systematic review of the literature*. Baltimore, MD. Retrieved from http://reprolineplus.org/taxonomy/term/332

Bulloch, G., & Long, J. (2012, October). *Exploring the value proposition for Impact Sourcing: The buyer's perspective*. Washington, DC: Accenture. Retrieved from http://www.rockefellerfoundation.org/news/publications/exploring-value-proposition-impact

Burnett, N., & Jayaram, S. (2012, October). *Skills for employability in Africa and Asia*. Washington, DC: Results for Development Institute. Retrieved from http://r4d.org/sites/resultsfordevelopment.org/files/resources/ISESE Skills Synthesis_Final_0.pdf

Burns, M. (2011). *Distance education for teacher training: modes, models, and methods*. Washington, DC: Education Development Center, Inc. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/DE Book-final.pdf

Burns, M. (2012). *Technology teaching and learning.* Beirut: Education Development Center. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/Technology Teaching and Learning - Research, Experience, & Global Lessons Learned.pdf

Carana Corporation. (2012, July). In El Salvador, Facebook subscribers "like" project workforce development efforts. *Carana*. Retrieved May 25, 2013, from http://www.carana.com/about-us/news-archives-all/794-in-el-salvador-facebook-subscribers-like-project-workforce-development-efforts

de Carvalho, A., Klarsfeld, L., Lepicard, F. (2011). *Leveraging information and communication technology for the base of the pyramid*. Paris, France: Hystra. Retrieved from http://www.afd.fr/webdav/site/afd/shared/PORTAILS/SECTEURS/ENTREPRISE/pdf/Rapport ICT_web-Final.pdf

Cherie Blair Foundation for Women, GSMA Development Fund, & Vital Wave Consulting. (2010). *Women & mobile: A global opportunity.* London, UK: GSMA. Retrieved from http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/GSMA_Women_and_Mobile-A_Global_Opportunity.pdf

Clifford, M. (2013, March 18). Bring your own device (BYOD): Why it's a good idea. *Innovation Excellence*. [Web log post]. Retrieved from http://www.innovationexcellence.com/blog/2013/03/18/bring-your-own-device-byod-why-its-a-good-idea/

Cole, S. A., & Fernando, A. N. (2012, November 21). *The value of advice : Evidence from mobile phone-based agricultural extension* [Working Paper 13-047]. Boston, MA: Harvard Business School. Retrieved from http://www.hbs.edu/faculty/Publication Files/13-047_08f3cd3a-dfb4-482e-af80-f53b20f1ad46.pdf

Dawes, L., & D'Elia, N. (2011a, September). Preliminary Findings Uganda Research Structure. London, UK: GSMA. Retrieved from http://www.slideshare.net/Lauren-Jane/m-learning-research-uganda-preliminary-findings-200911

Dawes, L., & D'Elia, N. (2011b, October). mLearning research Ghana Preliminary findings. London, UK: GSMA. Retrieved from http://www.slideshare.net/Lauren-Jane/mlearning-initial-findings-ghana-november-2011

DG Murray Trust. (2012, January). Career Planet: Connecting youth to opportunity using mobile technology. [Learning Brief 13]. *Hands-on: Learning from our implementing partners.* Cape Town, South Africa: Author. Retrieved from http://www.dgmt.co.za/files/2012/02/LearningBrief-13-FINAL.pdf

Digital Divide Data. (n.d.). After DDD: Graduation & career growth. Retrieved April 3, 2013, from http://www.digitaldividedata.org/impact/graduation/

Education Development Center. (2012). *The Somali Shaqodoon Project* (p. 10). Retrieved from http://idd.edc.org/sites/idd.edc.org/files/EDC Education in Fragility Series-Somalia Shaqodoon.pdf

Education Development Center. (2013a). *AKAZI KANOZE: Youth Livelihoods Project.* Retrieved from http://akazikanoze.edc.org/

Education Development Center. (2013b). *AKAZI KANOZE Youth Livelihoods Project. Presentation September 2009–September 2013*. Retrieved from http://akazikanoze.edc.org/sites/akazikanoze.edc.org/files/Akazi%20Kanoze%20Activity%20Summary.pdf

Enge, K. (2011, July 25). *Elimu kwa Teknolojia - a BridgeIT program. Summative evaluation*. Baltimore. MD: International Youth Foundation. Retrieved from http://www.iyfnet.org/sites/default/files/BridgeIT_Eval_Exec_Summary_Jul2011.pdf

EQUIP3. (2011). *Employment training & placement toolkit*. Washington, DC: USAID. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/Youth_ICT_Toolkit_FINAL.PDF

EQUIP3. (2012a). *Technology in the HP Life Entrepreneurship Program: Summary report findings*. Washington, DC: USAID. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/Technology in the HP Life Entrepreneurship Program - Summary Report Findings.pdf

EQUIP3. (2012b). *Gender in youth livelihoods and workforce development programs.* Washington, DC: USAID. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/Gender%20in%20Youth%20Livelihoods%20-%20Report.pdf

Florez-Arango, J. F., Iyengar, M. S., Dunn, K., & Zhang, J. (2011). Performance factors of mobile rich media job aids for community health workers. *Journal of the American Medical Informatics Association (JAMIA)*, *18*(2), 131–7. doi:10.1136/jamia.2010.010025

Furuholt, B., & Matotay, E. (2011). The developmental contribution from mobile phones across the agricultural value chain in rural Africa. *The Electronic Journal on Information Systems in Developing Countries, 48*(7), 1–16. Retrieved from http://www.ejisdc.org/ojs2/index.php/ejisdc/article/viewFile/849/377

Garrido, M., Sullivan, J., Gordon, A., & Coward, C. (2009, April). *Researching the links between ICT skills and employability : An analytical framework* [CIS Working paper No. 4]. Seattle, WA: Center for information & Society. Retrieved from https://digital.lib.washington.edu/dspace/bitstream/handle/1773/16310/TASCHA_ICT-Employability-Framework_2009.pdf?sequence=1

Geldof, M., & Holloway, R. (2011). Earphones are not for women: Gendered ICT use among youths in Ethiopia and Malawi. *Information Technologies & International Development, 7*(4), 69–80. Retrieved from http://itidjournal.org/itid/article/viewFile/792/333

Grameen Foundation. (n.d.). *A Profile of the Community Knowledge Worker Project.* Retrieved from http://gaap.ifpri.info/files/2010/10/ckw-pogram-brief.pdf

Grimshaw, D., & Kala, S. (2004, November). Strengthening rural livelihoods: The impact of information and communication technologies in Asia. *Chemistry & Biodiversity, 1*(11), 1829–1841. Retrieved from http://onlinelibrary.wiley.com/doi/10.1002/cbdv.200490137/abstract

GSMA. (2011, December). *African Mobile Observatory 2011: Driving Economic and Social Development throgh Mobile Services*. London, UK: Author. Retrieved from http://www.gsma.com/publicpolicy/wp-content/uploads/2012/04/africamobileobservatory2011-1.pdf

GSMA Development Fund. (2010, December). *mLearning: A platform for educational opportunities at the base of the pyramid.* London, UK: Author. Retrieved from http://www.mobileactive.org/files/file_uploads/mLearning_Report_Final_Dec2010.pdf

GSMA Development Fund. (2011). *Shaping The Future – Realising the potential of informal learning through mobile*. London, UK: Author. Retrieved from http://mastercardfdn.org/wp-content/uploads/GSMA-and-The-MasterCard-Foundation-mLearning_Report.pdf

GSMA Mobile and Development Intelligence. (2013). *Scaling Mobile for development: A developing world opportunity.* London, UK: Author. Slideshare presentation retrieved from https://mobiledevelopmentintelligence.com/insight#Scaling_Mobile_for_Development:_A_developing_world_opportunity

Harji, K., Best, H., Essien-Lore, E., & Troup, S. (2013, May). *Digital Jobs: Building Skills for the Future*. New York, NY: Rockefeller Foundation. Retrieved from http://www.rockefellerfoundation.org/uploads/files/9c9e4885-68e6-4670-9d48-11a830f92401-website.pdf

Hartmann, A., & Linn, J. F. (2008, October). *Scaling up: A framework and lessons for development effectiveness from literature and practice.* Washington, DC: Brookings Institution. Retrieved from http://www.brookings.edu/~/media/research/files/papers/2008/10/scaling%20up%20aid%20linn/10_scaling_up_aid_linn.pdf

Ikatu International. (2010). *Global Youth Employment : An Overview of Need and Interventions*. Devon, PA: Author. Retrieved from http://www.ikatuinternational.org/PDFs/1_YouthEmployment_AnOverviewOfNeedAndInterventions_Ikatu.pdf

International Labour Organization. (2007). *Toolkit for Mainstreaming Employment and Decent Work*. Geneva, Switzerland: Author. Retrieved from http://www.fao-ilo.org/fileadmin/user_upload/fao_ilo/pdf/MainstreamingDEtoolkit.pdf

International Labour Organization. (2012a). *Global Employment Trends 2012: Preventing a deeper jobs crisis*. Geneva, Switzerland: Author. Retrieved from http://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_171571.pdf

International Labour Organization. (2012b). *The youth employment crisis: Time for action.* [International Labour Conference, 101st Session, Report V]. Retrieved from http://www.ilo.org/wcmsp5/groups/public/@ed_norm/@relconf/documents/meetingdocument/wcms_175421.pdf

International Telecommunication Union. (2010). *World Telecommunication/ICT Development Report 2010: Monitoring the WSIS targets. A mid-term review*. Geneva, Switzerland: Author. Retrieved from http://www.uis.unesco.org/Communication/Documents/WTDR2010_e.pdf

International Telecommunication Union. (2011). *Measuring the Information Society 2011*. Geneva, Switzerland: Author. Retrieved from http://www.itu.int/net/pressoffice/backgrounders/general/pdf/5.pdf

International Telecommunication Union. (2012a, February). *A Bright Future in ICTs opportunities for a new generation of women*. Geneva, Switzerland: Author. Retrieved from http://www.itu.int/ITU-D/sis/Gender/Documents/ITUBrightFutureforWomeninICT-English.pdf

International Telecommunication Union. (2012b). *Measuring the Information Society 2012. Executive summary*. Geneva, Switzerland: Author. Retrieved from http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-ICTOI-2012-SUM-PDF-E.pdf

International Telecommunication Union. (2012c). *Measuring the Information Society 2012*. Geneva, Switzerland: Author. Retrieved from http://www.itu.int/ITU-D/ict/publications/idi/material/2012/MIS2012_without_Annex_4.pdf

International Telecommunication Union. (2013). *Module 4: Using ICTs to promote education and job training for persons with disabilities*. Geneva, Switzerland: Author. Retrieved from http://www.connectaschool.org/sites/default/files/pdf_cache/8645dc8335440b05f7371869e8af3dcc.pdf

International Youth Foundation. (2012, June). Improving gender equality in youth livelihood programs [six-page report]. *Field Notes, 5*(19)*.* Baltimore, MD: Author. Retrieved from http://iyfnet.org/sites/default/files/FieldNotesGenderEquality.pdf

International Organization for Standardization (ISO) & International Electrotechnical Commission (IEC). (2001). Guide 71 *Guidelines for standards developers to address the needs of older persons and persons with disabilities*. Geneva, Switzerland: Author. Retrieved from http://www.iso.org/iso/iso_iec_guide_71_2001.pdf

Izumi, L. T., & Parisi, E. (2013). *One World School House vs. Old World Statehouse. The Khan Academy and California Red Tape*. San Francisco, CA: Pacific Research Institute. Retrieved from http://www.pacificresearch.org/fileadmin/templates/pri/images/Studies/PDFs/2013-2015/KhanStudy_web.pdf

Jayaram, S. (2013, March). *Training Models for Employment in the Digital Economy*. Washington, DC: Results for Development. Retreived from http://r4d.org/sites/resultsfordevelopment.org/files/R4D2012_ICT%20Models.pdf

JBS International. (2013). USAID Youth Policy and Learning Project Briefing Paper: Examining the Evidence in Youth Workforce Development. Washington, D.C.: USAID. Retrieved from http://www.usaid.gov/sites/default/files/documents/1865/USAID%20state%20of%20the%20field%20youth%20workforce%20development%20final%202_11.pdf

Kam, M., Kumar, A., Jain, S., Mathur, A., & Canny, J. (2009). Improving literacy in rural India: cellphone games in an after-school program. In *Proceedings of the 3rd International Conference on Information and Communication Technologies and Development* (pp. 139–149). Piscataway, NJ: IEEE Press.

Knight, E., & Casilli, C. (2012). Mozilla open badges. In D. G. Oblinger (Ed.), *Game Changers: Education and Information Technologies* (pp. 279–284). Louisville, CO: EDUCAUSE. Retrieved from http://net.educause.edu/ir/library/pdf/pub7203.pdf

Kubzansky (2011). *Job Creation Through Building the Field of Impact Sourcing* [Working paper]. New York, NY: Rockefeller Foundation. Retrieved from http://www.rockefellerfoundation.org/media/download/c2cbb5d3-500c-4ced-8387-a7469b567b98

Lee, K. H., & Bellemare, M. F. (2012, September 8). *Look Who's Talking: The Impacts of the Intrahousehold Allocation of Mobile Phones on Agricultural Prices*. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2063039

Making Cents. (2011). *State of the Field in Youth Enterprise, Employment and Livelihoods Development. A Guide for Programming, Policymaking and Partnership Building.* Washington, DC: Author. Retrieved from http://www.youtheconomicopportunities.org/sites/default/files/sotf/2010StateoftheFieldPub.pdf

Martin, B. L., & Abbott, E. (2011). Mobile phones and rural livelihoods: Diffusion, uses, and perceived impacts among farmers in rural Uganda. *Information Technologies & International Development*, *7*(4), 17–34. Retrieved from http://itidjournal.org/index.php/itid/article/view/789/330

Mathur, A., Ramachandran, D., Cutrell, E., & Balakrishnan, R. (2011). An exploratory study on the use of camera phones and pico projectors in rural India. *Proceedings of the 13th International Conference on Human Computer Interaction with Mobile Devices and Services.* Stockholm, Sweden: MobileHCI. Retrieved from http://research.microsoft.com/pubs/156112/MobileHCI2011-Mathur-cameraphone.pdf

Mcgrath, D. (2009, August 6). Analyst predicts rapid growth for pico projectors. *EE Times.* Retrieved from http://www.eetimes.com/document.asp?doc_id=1171501

McKinsey & Company, & GSMA Development Fund. (n.d.). *Transforming learning through mEducation*. Milan, India: McKinsey & Company. Retrieved from http://mckinseyonsociety.com/downloads/reports/Education/mEducation_whitepaper_April%201_vFINAL.pdf

mEducation Alliance. (2012). 2nd annual mEducation Alliance international symposium call for proposals. Washington, DC: Author. Retrieved from http://www.meducationalliance.org/sites/default/files/2013_meducation_symposium_call_for_proposals_0.pdf

mEducation Alliance. (2012, December 10). Hands-on demonstrations. *Mobile Tools for Youth Workforce Development Learning Series.* Workshop conducted from The Stimson Center, Washington, DC.

Mercy Corps. (2013). *MicroMentor – Mission & Program Overview.* Retrieved from http://www.micromentor.org/img/pub/docs/micromentor-overview.pdf

Miyazawa, I. (2009, November 15). *Literacy promotion through mobile phones.* Paper presented at The 13th UNESCO-APEID International Conference and World Bank-KERIS High Level Seminar on ICT in Education, Hangzhou, China. Retrieved from http://unesco.org.pk/education/documents/Project%20Brief%20Paper_ICT.pdf

Moraa, H., & Murage, K. (2012, August). *ICT hubs model: Understanding the factors that make up the Activspaces model in Buea, Cameroon*. Nairobi, Kenya: iHub Research. Retrieved from http://www.research.ihub.co.ke/uploads/2012/september/1348591625_819_404.pdf

Moraa, H., & Mwangi, W. (2012). *The impact of ICT hubs on African entrepreneurs: A case study of iHub (Nairobi)*. Nairobi, Kenya: iHub Research. Retrieved from http://www.ihub.co.ke/downloads/ihub_entrepreneurs_report.pdf

Muyanga, M., & Jayne, T. S. (2006). *Agricultural extension in Kenya: Practice and policy lessons* [Working paper]. Nairobi, Kenya: Tegemeo Institute of Agricultural Policy and Development. Retrieved from http://ageconsearch.umn.edu/bitstream/55168/2/wp26.pdf

Naimi, N., & Amarkhail, N. (n.d.). *Use of short message service (SMS) in strengthening the quality of health services in Afghanistan.* [PowerPoint slides]. Retrived from http://icohere-presentations.com/presentations/SHOPS2010/PDF/EH-Naimi.pdf

Oxford Economics. (2011). *The new digital economy: How it will transform business*. Oxford, UK: Author. Retrieved from http://www.pwc.com/gx/en/technology/publications/assets/the-new-digital-economy.pdf

Pal, J., Freistadt, J., Frix, M., & Neff, P. (2009). *Technology for employability in Latin America: Research with at-risk youth and people with disabilities*. Seattle, WA: Technology & Social Change Group, University of Washington. Retrieved from http://tascha.uw.edu/publications/technology-for-employability-in-latin-america-research-with-at-risk-youth-and-people-with-disabilities/

Pezzullo, S. (2011a). *The role of technology in preparing disadvantaged youth for the world of work: Findings from three Latin American projects* (Learning Series No. 7). Cordoba, Argentina: International Youth Foundation. Retrieved from http://iyfnet.org/sites/default/files/entra21_Learning_7_ExecSum.pdf

Pezzullo, S. (2011b). *Equipping youth who are harder to hire for the labor market:Results from entra21* (Learning Series No. 8). Cordoba, Argentina: International Youth Foundation. Retrieved from http://iyfnet.org/sites/default/files/Entra21_Learning Series_8_Eng.pdf

Plan. (2010). *Because I Am a Girl. The State of the World's Girls 2010. Digital and urban frontiers: girls in a changing landscape*. Surrey, UK: Author. Retrieved from http://plan-international.org/girls/pdfs/BIAAG_2010_EN2.pdf

Porter, G., Hampshire, K., Abane, A., Munthali, A., Robson, E., Mashiri, M., & Tanle, A. (2012). Youth, mobility and mobile phones in Africa: Findings from a three-country study. *Information Technology for Development*, *18*(2), 145–162. doi:10.1080/02681102.2011.643210

Praekelt Foundation. (2012). *Ummeli*. Available at http://ummeli.com/index.html

Puerto, O. S. (2007). *International experience on youth employment interventions: The youth employment inventory*. Retrieved from http://siteresources.worldbank.org/INTLM/Resources/390041-1188243960961/YEI_LessonsLearned_rev07-06.pdf

Raftree, L. (2013, March 25). Mobile technology and youth workforce development programs with girls and young women [Web log entry]. Retrieved March 25, 2013, from http://lindaraftree.com/2013/03/25/mobile-technology-and-workforce-development-programs-with-girls-and-young-women/

Reardon, M. (2013, March 4). Smart phones to outsell feature phones for first time in 2013. *CNet News*. Retrieved from http://news.cnet.com/8301-1035_3-57572349-94/smartphones-to-outsell-feature-phones-in-2013-for-first-time/

Riley, P., & BonTempo, J. (2011). *Mobiles for quality improvement. Pilot in Uganda*. Bethesda, MD: Abt Associates Inc. Retrieved from http://www.shopsproject.org/sites/default/files/resources/SHOPS%20m4QI%20Uganda%20Pilot%20Report.pdf

RLabs. (n.d.). *Innovation incubator and accelerator.* Retrieved from http://www.rlabs.org/what-we-do/innovation-incubator/

Shroff, G., & Kam, M. (2011). Towards a design model for women's empowerment in the developing world. In *Proceedings of the 2011 annual conference on human factors in computing systems.* New York, NY: ACM Press. doi:10.1145/1978942.1979368

Souktel. (2011). Souktel Inc – JobMatch Social ROI metrics July 2011.

SRI International, & Microsoft Partners in Learning. (2011). *Innovative teaching and learning research: 2011 findings and implications*. Washington, DC: ITL Research. Retrieved from http://www.itlresearch.com/images/stories/reports/ITL%20Research%202011%20Findings%20and%20Implications%20-%20Final.pdf

Sullivan, B. (2011). The new age of radio. How ICTs are changing rural radio in Africa. Ottawa. Canada: Farm Radio International. Retrieved from http://www.farmradio.org/wp-content/uploads/farmradio-ictreport2011.pdf

Tejaswi, M. J. (2013, March 14). What's cooking? A blue collar job for Rs 20,000. *The Times of India-Bangalore*. Retrieved from http://articles.timesofindia.indiatimes.com/2013-03-14/bangalore/37712592_1_job-seekers-blue-collar-mobile-internet

TNS, STC, & Cherie Blair Foundation for Women. (2012). *Women entrepreneurs in mobile retail channels: Empowering women, driving growth*. London, UK: Cherie Blair Foundation for Women. Retrieved from http://www.cherieblairfoundation.org/wp-content/uploads/2012/07/Women-Entrepreneurs-in-Mobile-Retail-Channels.pdf

UNESCO. (2011). *Accessible ICTs and personalized learning for students with disabilities: A dialogue among educators, industry, government and civil society.* Geneva, Switzerland: Author. Retrieved from http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/accessible_ict_personalized_learning_2012 .pdf

UNESCO. (2012a). *The global demand for primary teachers—2012 Update: Projections to reach universal primary education by 2015* (UIS Information Bulletin No. 10). Geneva, Switzerland: Author. Retrieved from http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/accessible_ict_personalized_learning_2012 .pdf

UNESCO. (2012b). *Mobile learning for teachers in Asia: Exploring the potential of mobile technologies to support teachers and improve practice* [UNESCO Working Paper Series on Mobile Learning]. Geneva, Switzerland: Author. Retrieved from http://unesdoc.unesco.org/images/0021/002162/216284E.pdf

USAID. (n.d.). *Annex X. Foreign assistance standardized program structure and definitions*. Washington, DC: Author. Retrieved from http://ghiqc.usaid.gov/tasc3/docs/650-09-313/annex_x.pdf

USAID. (2012a). *USAID Gender equality and female empowerment policy*. Washington, DC: Author. Retrieved from http://pdf.usaid.gov/pdf_docs/pdact200.pdf

USAID. (2012b). *Mobile technologies for employability in Europe and Eurasia desk study*. Washington, DC: Author.

USAID. (2012c). *Youth in development: Realizing the demographic opportunity*. Washington, DC: Author. Retrieved from http://www.usaid.gov/sites/default/files/documents/1870/Youth_in_Development_Policy.pdf

USAID. (2013). *USAID forward progress report 2013*. Washington, DC: Author. Retrieved from http://www.usaid.gov/sites/default/files/documents/1868/2013-usaid-forward-report.pdf

USAID & University of Illinois at Urbana-Champaign. (n.d.). Farmbook. *Modernizing extension and advisory services*. Retrieved April 2, 2013, from http://www.meas-extension.org/workshops/farmbook

Vinogradova, E. (2012, May 30). *Role of technology in entrepreneurship training: Evidence from HP LIFE program* [Presentation]. Washington, DC: USAID. Retrieved from http://www.youtheconomicopportunities.org/resource/645/role-technology-entrepreneurship-training-evidence-hp-life-program

Walton, M., & Donner, J. (2012, October). *Public access, private mobile: The interplay of shared access and the mobile Internet for teenagers in Cape Town*. Seattle: WA: Technology & Social Change Group. Retrieved from http://www.globalimpactstudy.org/wp-content/uploads/2012/11/Public-access-private-mobile-final.pdf

Walton, R., Putnam, C., Johnson, E., & Kolko, B. E. (2009). Skills are not binary : Nuances in the relationship between ICT skills and employability. *Information Technologies and International Development*, *5*(2), 1–18.

The World Bank. (2004, May). Reducing poverty, sustaining growth (Unedited case study summaries). Presented at the *Scaling Up Poverty Reduction Conference*, Shanghai, China. Retrieved from http://www.fordham.edu/economics/mcleod/Uganda_HIVAIDS_Shanghai.pdf

The World Bank. (2010). *Active labor market programs for youth: A framework to guide youth employment interventions* (World Bank Employment Policy Primer, November 2010, No. 16). Washington, DC: Author. Retrieved from http://siteresources.worldbank.org/INTLM/214578-1103128720951/22795057/EPPNoteNo16_Eng.pdf

The World Bank. (2011). *ICT in agriculture: Connecting smallholders to knowledge, networks, and institutions*. Washington, DC: Author. Retrieved from http://www.commdev.org/userfiles/ICT_in_Agriculture_light.pdf

The World Bank. (2012). *2012 Information and Communications for Development: Maximizing Mobile*. Washington, DC: Author. DOI: 10.1596/978-0-8213-8991-1. Retrieved from http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/IC4D-2012-Report.pdf

Worldreader. (2012, June 8). Decreasing our breakage rate [Web log entry]. Retrieved May 24, 2013, from http://www.worldreader.org/blog/how-we-decreased-our-breakage-rate/

Worldreader, ILC Africa, & USAID. (2012). *iRead Ghana study: Final evaluation report*. Washington, DC: USAID. Retrieved from http://www.worldreader.org/uploads/Worldreader%20ILC%20USAID%20iREAD%20Final%20Report%20Jan-2012.pdf

Yoza Project. (2011). *Yoza cellphone stories: Quick overview.* Retrieved from http://m4lit.files.wordpress.com/2012/05/3_yoza-cellphone-stories_082010_to_082011.pdf

Annexes

ANNEX 1: mYWD Initiatives, Organizations, Projects, Products and Services Reviewed

**See Annex 2 and 3 for evaluations or research associated with starred initiatives*

Workforce Education and Training: Basic education, literacy and numeracy

Initiatives, Organizations, Projects, Products and Services	Summary
Name: PAJE-Néita/Stepping Stone Implemented by: Education Development Center Funder: USAID/EQUIP3 Geographic Location: Mali	Accompanies 12,000 youth (ages 14–25) toward entrepreneurship in four regions of Mali. Aimed at out-of-school youth, Stepping Stone is a mobile phone-based curriculum that supports youth to improve their literacy, math, and oral French as a first step to building entrepreneurship skills and supporting increased access to market information systems once basic skills are more developed. The platform includes a letter reader, number and math problem reader, syllable reader, word reader, digital textbooks, assessments and interactive audio. The content delivery platform allows non-technical users to publish multimedia content on low-cost phones in any language. Developed for low-end Nokia phones that run Java applications and are widely available in the market. Further information: http://idd.edc.org/projects/mali-support-youth-entrepreneurs-project-paje-ni%C3%A8ta
Name: BridgeIT* Implemented by: International Youth Foundation and Ayala Funders: USAID, Nokia Siemens Networks, Pearson Foundation, Ministry of Education Tanzania, Nokia, Vodacom Foundation Geographic Location: Tanzania	The International Youth Foundation's BridgeIT program was rolled out at primary school level in both the Philippines (called Text2Teach) and Tanzania. In the program, teachers downloaded video content using mobile phones connected to televisions in their classrooms, allowing rural schools to access locally-developed or adapted educational content. The videos were accompanied by learner-centered lesson plans. The program contained a life skills portion in addition to math and science videos. The final evaluation explored student attitudes to entering the workforce immediately following primary school, finding that post-program, fewer students agreed that entering the workforce post-primary was a good idea. Thus, it appeared that the Life Skills program was having an effect on student attitudes toward staying in school rather than joining the workforce at an early age (Enge, 2011). Further information: http://www.iyfnet.org/bridgeit

Name: Jokko Initiative* Implemented by: Tostan Funding partner: UNICEF Geographic Location: Senegal	Tostan's Jokko Initiative devised simple ways to train community members on basic phone functions. Text messaging and an SMS community forum encouraged participants to use their literacy skills. After five months, the 15 villages that were trained and participated in the forum had higher literacy and numeracy rates than five villages that underwent the same training, but did not have access to the SMS forum. Use of the forum decreased, however, once the project ended (Beltramo & Levine, 2010). Further information: http://tostan.org
Name: Project ABC* Implemented by: Catholic Relief Services/Niger, Tufts University, and the University of Oxford Funders: Program donors: Catholic Relief Services (CRS), Fletcher School/Tufts University, Hitachi Center for Technology and International Affairs, Blum Center for Developing Economies at University of California-Berkeley, Center for Information Technology Research in the Interest of Society at the University of California-Berkeley Evaluation donors: The Gates Foundation, Fell Fund at the University of Oxford Geographic Location: Niger	Project ABC is a complementary literacy and numeracy module for simple mobile phones that uses calling and text in the local language to reinforce literacy. It is implemented in 110 villages in Niger. A randomized control trial (RCT) established that it resulted in higher math scores even eight months after the end of classes. No substantial gains were seen with literacy, however, in the full sample. The authors of the study suggest literacy impacts could occur during the second year of the project (Aker, Ksoll, & Lybbert, 2010b). Further information: http://sites.tufts.edu/projectabc/

Name: Girls Literacy Program in Pakistan* Implemented by: UNESCO Funder: UNESCO Geographic Location: Pakistan	UNESCO's girls' literacy program in Pakistan supplied semi-literate learners with mobile handsets to receive SMS messages in Urdu that they copied into workbooks. Learners also created and sent text messages. Literacy skills at the end of the four-month period had remarkably improved. At the start of the program, more than half of learners and their family members were negative about the program, did not agree that adolescents should have mobile phones, and doubted the effectiveness of the approach. At the end of the program, 87% were satisfied (Miyazawa, 2009). The program is being expanded due to the encouraging results as compared with conventional literacy programs. (UNESCO, 2012b) Further information: http://unesco.org.pk/
Name: FunDza Literacy Trust Implemented by: FunDza Literacy Trust Geographic Location: South Africa	Works to popularize reading through mobiles, as a way of building literacy and life skills. The program uses the Mxit mobile platform in South Africa. Ninety percent of FunDza's readers on MXit are in the 15–25 age range and over 50% use basic feature phones to access content. The mobile networks build communication skills by encouraging users to give feedback on the books, access additional content, participate in interactive storytelling, enter into discussions, showcase their own writing, and submit works for contests. Viral approaches encourage youth to comment, share, and create their own communities within the platform. FunDza notes that stories help generate conversations and boost cultural values and life skills discussions. Further information: http://www.fundza.co.za/what-we-do/ http://ventureburn.com/2012/07/fundza-an-experiment-in-mobile-books/
Name: Yoza Implemented by: Yoza Funder: Shuttleworth Foundation Geographic Location: South Africa	Yoza, originally known as m4Lit uses mobile phones to support reading and writing by youth in South Africa. In just seven months two m-novels were read over 34,000 times on mobile phones. Readers can interact with stories as they unfold, discuss plots, leave comments, and submit their own written pieces as part of a competition. A bigger m-novel offering started in 2010 and Yoza reports 300,000 complete reads of m-novels, stories and poems between August 2010–2011, and 145,000 unique visitors (Yoza, 2011). Yoza is available on MXit in South Africa and Kenya. Further information: http://yozaproject.com/about-the-project/

Name: MoMaths Implemented by: Nokia Funder: Nokia Geographic Location: global	Students can take math quizzes and teachers can track student responses via a computer. Teachers can interact with students who do SMS-based exercises on their mobile phones. Formerly only for formal education but opening to non-formal. Further information: http://www.nokia.com/in-en/life/

Workforce Education and Training: Language learning

Name: BBC Janala Implemented by: British Broadcasting Corporation Funder: British Broadcasting Corporation Geographic Location: Bangladesh	BBC's Janala, which targets Bangladeshis living on under £2 a day with daily 3-minute audio lessons that can be accessed via a short code on a mobile or downloaded from the Internet site. The program is the largest, multi-platform English language initiative in the developing world.[40] Content is also available via newspaper free of charge and targeted television programming has enabled the project to reach wide audiences, increasing the number of users. As of September 2011, there had been over 15 million calls to the mobile service and more than 250,000 audio lessons downloaded from the mobile site. Further information: http://bbcjanala.com
Name: Najja7ni Implemented by: Pro-Invest Geographic Location: Tunisia	Pro-Invest in Tunisia offers learning support in a number of subjects ranging from primary school to senior high school on its Najja7ni application. In line with the official Ministry of Education curriculum, Tunisian teachers prepared a total of 2,500 questions around mathematics, natural sciences, Arabic, French, and English. The application is available on any mobile phone. Najja7ni has over 500,000 subscribers,[41] with peak usage during school exam periods. Further information: http://m-education4all.com/home_page.html

[40] See http://bbcjanala.com

[41] ProInvest, personal communication, March 12, 2013.

Workforce Education and Training: *Hard skills*

Name: Khan Academy Implemented by: Khan Academy Funder: Khan Academy Geographic Location: global	Khan Academy's videos are free and available to the public to access and follow along, create local learning groups, and to use for self-directed learning. The Khan Academy is a proponent of "flipped" classrooms, where the majority of the lecturing is done via video and students come together for discussions and group work, allowing more quality time and discussion with teachers during class time. (Izumi & Parisi, 2013). Further information: http://khanacademy.org
Name: Strengthening Health Outcomes through the Private Sector (SHOPS)* Implemented by: Abt Associates, Inc., in partnerships with Banyan Global, Jhpiego, Marie Stopes International, Monitor Group, and O'Hanlon Health Consulting Funder: USAID Geographic Location: Uganda	The Strengthening Health Outcomes through the Private Sector (SHOPS) program in Uganda used SMS-based messaging to reinforce positive health worker behaviors that had been learned through training. Many developing countries have a severe shortage of health providers, and many of the providers who are working have only limited access to up-to-date clinical protocols or face-to-face trainings. Program implementers used mobiles as a channel through which to improve quality of care. For each quality of care indicator, four messages were developed (two reinforcing tips, reminders, or encouragement and two assessment questions to trigger and test recall of knowledge). Participants reported being motivated by reminders to adhere to hand-washing rules; referring to training manuals when receiving a quiz question about treatment protocols; re-learning steps in instrument sterilization they had forgotten; and using tips about pain management to more closely attend to clients (Riley & BonTempo, 2011). Further information: http://www.shopsproject.org/about

Name: TechChange Implemented by: TechChange Funder: for profit social enterprise, various Geographic Location: global	TechChange provides scalable and interactive technology training for social change by delivering online certificate courses to individuals, building customized courses and learning experiences for organizations, and strengthening technology-enabled communities of practice. The organization trains social change practitioners and international development professionals in the effective use of the latest technology applications and platforms in support of their missions. Since its founding in 2011, TechChange has trained over 1,000 students in 80 countries through online and in-person courses. The online course, Mobile Phones for Public Health, for example, examines how mobile technologies are revolutionizing approaches to patient care and management, point-of-care support for health workers, health education, diagnostics, and supply chain management and logistics. Teaching methods include case studies, guest expert interviews, and interactive exercises. Online courses allow the organization to reach a wider audience at a lower cost than in-person training. Because online learning has historically been linear and isolated, TechChange has developed a learning platform that is both social and collaborative. Further information: http://techchange.org
Name: Youth ICT Toolkit Implemented by: International Youth Foundation and Education Development Center Funder: USAID-EQUIP3 Geographic Location: East Africa focused	The Youth ICT toolkit was developed by the International Youth Foundation (IYF) and Education Development Center (EDC) as part of the EQUIP 3 program to empower local partners to implement youth employability programs in three sectors: ICT, health, and agriculture. These were identified as growth industries with a high potential for employing youth. The toolkit provides program managers with detailed information on how to establish training programs that will impart to youth the skills required to secure formal employment or start their own businesses in ICT-related areas such as web design, sales, cyber café management, mobile application development, call center agents, and network management and ICT hardware maintenance; a number of health jobs such as data entry and health data manager; and various agricultural areas. The program uses a holistic approach, incorporating life skills, basic computer skills, English language skills, and entrepreneurial skills. For each job/skill set, the toolkit provides an overview of the job and expected training outcomes, along with student prerequisites. It also provides information about existing curricula, required technology, and teaching methods that work best for each course (EQUIP3, 2011) Further information: http://idd.edc.org/sites/idd.edc.org/files/Youth_ICT_Toolkit_FINAL.PDF

Workforce Education and Training: Soft skills

Name: eLife Implemented by: ChangeCorp Geographic Location: 22 countries	eLife aims to teach life and business skills to students, ages 10–16. The eLife Tablet gives teachers curriculum and lesson plan updates and valuable training techniques. It allows them to evaluate students and connect to resources outside the classroom. eLife uses basic mobile technology and works through the Magic Pencil app on an Android platform. Students report feeling more motivated and teachers have used the tablet to videotape and share their classroom experiences with teachers at other schools. eLife allowed ChangeCorp to reach 3,900 students in five schools as opposed to the 200 that could be reached through a typical afterschool program. The application is available in 22 countries in the local language and cultural context. Further information: http://change-corp.com/
Name: Nokia Life Tools Implemented by: Nokia Geographic Location: global	Nokia Life Tools provides users with Life Skills and Live Healthy services, available in English in 18 countries. Life Skills aims to help younger consumers develop interpersonal skills, self-confidence, and financial literacy and prepare for a job. Health content includes a mix of edutainment, tips, and trivia on nutrition, hygiene, fitness, and common illness prevention. Over 76 million people have used the original Nokia Life service on basic and feature phones. As of September 2012, the Nokia Life web application was released, which offers a richer web-based service through a newly developed technology that compresses Internet data up to 90%, allowing users to browse more quickly and use less data, thereby saving them money. Further information: http://press.nokia.com/2012/09/25/nokia-debuts-nokia-life-for-millions-of-consumers-ready-to-experience-a-smarter-Internet/
Name: Young Africa Live Implemented by: Praekelt Foundation in partnership with Vodafone Geographic Location: South Africa	Young Africa Live project uses the Mxit platform as a mobile peer network for awareness, education, and life skills related to sexual health and HIV/AIDS. Further information: http://praekeltfoundation.org/young-africa-live.html

Workforce Education and Training: Entrepreneurship training

Name: Shaqodoon Implemented by: Education Development Center and Shaqodoon Funder: USAID-EQUIP3 Geographic Location: Somalia, Somaliland	Shaqodoon is a national NGO that developed out of the Somali Youth Livelihoods Program implemented by EDC. As part of a wider youth workforce development program, Shaqodoon created a system called InfoMatch to provide youth with up-to-date information on jobs, internships, and short courses. InfoMatch allows job matching by SMS, online, or via a toll-free number that links with an automated opportunity matching system. The project also provides training and career development, business start-up information, and an interactive SMS chat forum for youth to connect around issues they are facing. The Dab iyo Dahab Interactive Radio Instruction (IRI) program operated as part of the Shaqodoon program. It used mobile phone-based audio quizzes to teach Somali youth soft skills, financial literacy, and how to become an entrepreneur. A series of 40 pre-recorded audio lessons imparted key concepts on saving, planning for the future, and budgeting. “Listening groups” gathered to hear the programs using a mobile handset amplified with speakers. Following the radio show, they would call a free number and take a quiz using touch-tone on their phone. Responses were tracked through a central database, providing real-time feedback about participation of partners and youth, and showing learning progress. Further information: http://www.shaqodoon.org/Pages/default.aspx http://idd.edc.org/about/news/fire-and-gold-helping-somali-youth-make-wise-financial-decisions
Name: Akazi Kanoze Implemented by: Education Development Center Funder: USAID Geographic Location: Rwanda	Akazi Kanoze, a holistic youth livelihoods program being implemented in Rwanda, includes vocational training and a work readiness curriculum that helps youth develop soft skills for employability. Some 80% of Akazi Kanoze graduates have a working mobile phone, so the program developed an SMS system together with Souktel. The system is aimed at sending information alerts to youth who graduate from the training programs and matching them with jobs. In addition, it allows program implementers to follow up with youth after graduation to track their transition to economic opportunities, civic participation, further training, and education as a way of supporting monitoring and evaluation of the program. The mobile job matching function has enrolled 594 youth and seven employers thus far (Education Development Center, 2013a,,2013b). Further information: http://akazikanoze.edc.org/

Name: Build your Business Implemented by: International Youth Foundation in partnership with Microsoft Funder: Microsoft Geographic Location: global	Build your Business is a new initiative that provides young people ages 16–35 with support to develop their own business. The platform's fourteen blended learning modules are available in English, French, and Arabic, and are aimed at entrepreneurs across all sectors. A young person can work through the curriculum in a self-guided and self-paced way using a module-by-module approach, in addition to facilitator-led classes. Build your Business was designed to be accessed primarily through a laptop interface. Modules are also available on DVDs and flash drives, meaning they are portable, accessible without an Internet connection, and not tied to a particular computer or learning center. Each module has three basic activities: case studies, market simulations, and interactive exercises that can be completed or saved for later use. Hands-on assignments are completed in the local community. The program's blended learning approach allows for contextualization at the moderator level, a key element of making workforce training relevant and applicable for young people in different environments. Further information: http://library.iyfnet.org/library/build-your-business-byb
Name: g.Maarifa Implemented by: g.Maarifa Geographic Location: Kenya	g.Maarifa offers an interactive SMS-based job training, evaluation, and placement service for low-income youth, ages 17–30. The platform hosts content on entrepreneurship, financial literacy, and professional etiquette. The local, context-based curriculum is case-based and practical, following cues from how business schools operate. Each unit has quizzes and a holistic exam at the end of each course tests students on applying lessons to real-life. Upon passing each course, students receive a certificate backed by the Kenya Ministry of Education. g.Maarifa also works with employers to identify and hire the highest performing individuals. Information about each course participant is held in a database that employers can access and filter based on their hiring criteria. To date, 32% of students who pass the g.Maarifa exam have found jobs in the formal market and 98% agree or strongly agree that the course is applicable and relatable. Further information: http://www.gmaarifa.com/about.html

Name: Yes Youth Can Western Implemented by: Winrock and partners Funder: USAID Geographic Location: Kenya	Yes Youth Can is a large scale, holistic youth empowerment program aimed at building the capacity of local youth organizations and promoting youth's voice in local and national policy. It also aims to facilitate and provide livelihood opportunities to youth and support girls and young women to actively participate. The program is working with mobile technology—smartphones—for education delivery and training of trainers, and has created a community of practice among mentors who work with youth. An e-Marketplace has been established where youth can buy and sell products and also share tips and advice. Youth businesses compete among themselves and the best business plan receives a smartphone. Youth groups can create to attract small loans from the international community. Further information: http://kenya.usaid.gov/programs/education-and-youth/1035
Name: Mobiworks Implemented by: Pro-Invest Geographic Location: Tunisia	Mobiworks from Pro-Invest assesses youth's knowledge of employment and entrepreneurship using quizzes, SMS alerts, and psychometric tests, and provides employment counseling to help youth discover personal and professional interests and plan for their careers. The app, launched in February 2013, moves youth through a series of quiz questions to develop a career profile, think about seeking a job, evaluate whether they have an entrepreneurial bent, and to learn how to manage finances. In addition, it helps with developing CVs, cover letters, learning about the job market, and preparing for a job interview. Further information: http://m-education4all.com/home_page.html

Demand Side Policies and Programs: Industry job creation and antidiscrimination efforts

Name: Poverty Reduction through Information and Digital Employment (PRIDE) Implemented by: Various partners Funder: Rockefeller Foundation Geographic Location: India, Africa	The PRIDE initiative worked with several partners in India and Africa to stimulate impact sourcing, an effort that works to employ individuals with limited opportunity for sustainable employment as principle workers in business processing outsourcing (BPO) centers. These partners provide high-quality, information-based services to domestic and international public and private sector clients. The program seeks to encourage large scale BPOs to hire youth from lower income settings. Further information: http://www.rockefellerfoundation.org/news/press-releases/rockefeller-foundation-foster-impact

Demand Side Policies and Programs: Information-related jobs, infomediaries

Name: Movercado Implemented by: PSI Mozambique Geographic Location: Mozambique	Movercado is an ecosystem primarily designed to increase the efficiency of aid delivery at the base of the pyramid. The system begins with local health workers participating in a face-to-face training on health outreach. These workers go door-to-door to conduct health training. The beneficiaries of the training receive an SMS code that they text in free of charge to confirm that training was conducted and to rate the training. Upon receipt of the SMS via Movercado, the sender gets a voucher for free airtime. The SMS messages are used to track health worker actions and performance. Those who perform well continue to work with Movercado and can receive additional training. Along with the workforce tracking elements, the system measures other health indicators and promotes healthy behaviors and stocking of healthier products in local stores. Further information: http://movercado.wordpress.com/
Name: Community Knowledge Worker (CKW) Program Implemented by: Grameen Foundation Funders: Gates Foundation, MTN Uganda, UN World Food Program, Google, Atlassian, and Salesforce.com Geographic Location: Uganda	Grameen Foundation is building a cross-country network of information intermediaries in Uganda. The infomediaries use mobile technology to deliver agricultural information both to and from smallholder farmers. The goal is that this agricultural extension work will result in increased yields, reduced losses, and increased incomes for poor, smallholder farmers. CKWs provide agricultural tips and advice, weather forecasts, a market platform for sellers and buyers, market prices for 42 commodities in 20 districts, an input supplier directory, and detailed information on farming of maize, beans, and so on. Grameen works with leaders in agricultural extension to collect, review, and package information for dissemination over the mobile phone and creates mobile phone applications that transmit this information or administer surveys. The organization is recruiting, training, and supporting a corps of CKWs at the grassroots level. The corps currently has 98 CKWs operating in Kapchorwa and Eastern Uganda and the number will expand. Further information: http://www.ckw.applab.org/section/index

Demand Side Policies and Programs: Subsidies

Name: Waseela-e-Rozgar Implemented by: Benazir Income Support Programme (BISP) Funder: Government of Pakistan and World Bank Geographic Location: Pakistan	Waseela-e-Rozgar is a skill development for employment program launched by the Government of Pakistan. Free mobile phone sets were provided, and in addition to a free mobile banking service, a debit card and smart card were introduced in 56 districts with plans to eventually reach more than 120 districts. After a poverty scorecard survey was done, some 7 million families were chosen to receive cash grants via mobile. Waseela-e-Haq is a long-term, interest-free grant of 300,000 rupees with basic training and counseling given to randomly selected beneficiaries for small businesses. Business success will be evaluated against objectively verifiable indicators. Randomly selected by computer ballot, one member per beneficiary family is offered free vocational training. Trainees must be between 18 and 45 years old. BISP bears all costs and provides a stipend of 6,000 rupees per month per trainee. Targeting of beneficiaries was done with a PMT-based poverty scorecard survey using GPS. Identity verification was done using a computer database. Payments are made with a smart card/mobile banking and branchless banking. Grievances are handled through various channels, including mobile and email. Further information: http://bisp.gov.pk

Demand Side Policies and Programs: Microwork

Name: Digital Divide Data Implemented by: Digital Divide Data Funder: A range of institutional, corporate, and other donors Geographic Location: Cambodia	Provides digital services to business process outsourcing companies. Hires and trains high school students for three to eight months to build computer and English skills in order to provide these services. Following training, individuals can work for DDD or find other higher quality digital jobs. Students work and go to school, earning a degree in three to four years. Further information: http://digitaldividedata.org/impact/
Name: Samasource Implemented by: Samasource Funder: Various foundation, corporate, and individual funders Geographic Location: Various countries	Samasource's proprietary platform breaks down complex data projects into microtasks that are completed by women and youth for business process outsourcing centers. Samasource sends these tasks to its network of microtaskers, who earn money for each task performed. Further information: http://samasource.org

Employment Services: Job search/job match

Name: Souktel Implemented by: Souktel Funder: Various funders Geographic Location: 22 countries	Souktel, launched in 2006, offers basic, accessible mobile job-find and education support services in 22 emerging markets. In these markets, poor infrastructure and transportation networks, unregulated and disorganized labor markets, low web access, lack of job preparation services, absence of government job-find services, and few private sector job information options result in a high disconnect between labor supply and demand. The company offers a number of mobile services including job matching. Some 30,000 job seekers and more than 700 employers are registered on JobMatch. Over 5,000 job seekers have been matched with work and training (mEducation Alliance, 2013). In a July 2011 survey, 84% of Palestinian job-seekers using the Souktel service reported a 92% reduction in time spent looking for work and 70% of Palestinian employers reported a 50% or greater reduction in hiring costs and time compared to alternative hiring methods (Souktel, 2011). A new program from Souktel connects women entrepreneurs to one another via a mobile social network to allow them to support and seek advice about running a small business. Further information: http://souktel.org
Name: Njorku Implemented by: Njorku Geographic Location: African continent	Njorku "crawls" a number of African career and recruitment websites, compiles the jobs listed on them, and provides a simple interface for job seekers to search and filter the jobs. The service typically logs 10,000 daily searches and an average of 100 new job seekers register daily. It works in seven African countries, both via web and mobile web.[42] Further information: http://www.njorku.com/welcome/about http://www.forbes.com/sites/mfonobongnsehe/2011/07/20/africas-best-tech-startups-njorku-com/
Name: mPawa Implemented by: Meltwater School of Technology Geographic Location: Ghana	A job matching service for blue-collar workers throughout Africa, beginning in Ghana. Job seekers can upload CVs and receive job notifications. Employers can find potential candidates and view their job histories. Further information: http://Mpawa.com

[42] Churchill Mambenanje, founder of Njorku, personal communication, March 29, 2013

Name: Babajobs Implemented by: Babajobs Geographic Location: India	Babajobs—known as India's "blue-collar" job site—started operations in 2007. It made its job matching services available via mobile in 2009 after developing partnerships with eight mobile network operators and seeing tremendous growth. Babajobs supports SMS alerts from job seekers as well as employers, with a focus on lower-end jobs. According to Sean Blagsvedt, CEO and founder of the service, blue-collar workers are aspiring to advance to reach the lower middle class and are effectively using Babajobs to manage their own advancement. With each job change, he reports, job seekers are earning an average of 20.1% more and their jobs are an average of 14 minutes closer to home. In 2012, Babajobs had over 300,000 new profiles created. Further information: http://www.babajob.com/start http://business.outlookindia.com/article.aspx?278075
Name: Dumaworks Implemented by: Dumaworks Geographic Location: Kenya	Dumaworks, a Kenyan mobile job-matching start-up that began in 2012, bases its approach on the fact that a majority of jobs in Kenya are in the informal sector and trust is a key element in hiring for a job in the developing world. Dumaworks invites job seekers and employers to create a DUMA profile with their job skills or their hiring criteria, geographic location, and their "reference network." This network is a list of people a member of the network feels confident referring for a job—a brother, a classmate, or even a boss. The platform operates like a social network for job references. When an employer posts a job, the Dumaworks software locates workers in the same social network, living in the same city, who have the necessary skills. Further information: http://dumaworks.com

Employment Services: Career services

Name: Career Planet Implemented by: Career Planet Funder: DG Murray Trust Geographic Location: South Africa	Career Planet, is a web-based career information service that targets young people throughout South Africa through platforms that bypass traditional barriers of cost and inaccessibility in order to equip youth with skills and information they need to seek opportunities or create their own (DG Murray Trust, 2011). Services include an interactive careers website, online career discovery workshops, teacher training, career readiness workshops, job shadowing days, and sustainable self-employment workshops. Online mobile kiosks (Internet kiosks in vehicles that are driven to rural areas on a weekly schedule) allow youth in areas with low web access to access the Career Planet online portal. Online tools, include a career path self-assessment tool, CV building mechanism, SME-support and entrepreneurship profile assessment tools, a jobs database and links to student finance, scholarships and qualification guides. Further information: http://www.careerplanet.co.za
Name: Ummeli Implemented by: Praekelt Foundation In partnership with Vodafone Geographic Location: South Africa	Implementers of Young Africa Live, which focuses on HIV, noted that youth were more concerned about employment and meaningful work than about HIV/AIDS. They created a second platform called Ummeli focusing on the issue of jobs to help youth feel less hopeless about finding meaningful work. The offerings on the Ummeli platform span several mYWD areas including connecting youth to education and skills building opportunities, job matching, and life skills training. Ummeli works on the Vodafone Live platform and is available to users with more advanced WAP-enabled phones at no cost. The organization found that 40–60% of youth stop actively looking for jobs six months after leaving school, therefore the platform aims to create an attitude shift to help youth stay active and engaged in other opportunities like volunteering and community work, even if the state of the economy makes it difficult to find employment. In addition to helping youth find job-related opportunities, Ummeli members can post opportunities and form communities to share tips or challenges and seek peer advice. At the end of 2012, the platform had a user base of 65,000 (Praekelt Foundation, 2012). Further information: http://www.ummeli.com/

Name: MicroMentor Implemented by: Mercy Corps Funder: A variety of corporate, foundation and private donors	MicroMentor offers a free mentoring service for entrepreneurs and a volunteering opportunity for business professionals to help small business owners access information and resources. Micromentor connects entrepreneurs with mentors, while an affiliate program helps organizations provide mentoring to clients. In addition, a community engagement program helps corporations, business groups, and alumni networks support local small businesses through skills-based volunteerism. MicroMentor has over 12,000 mentors in its database. Data show that MicroMentor helps businesses grow faster generate more revenue, and employ more staff (Albery, 2013). Further information: http://www.micromentor.org/mentor/about-partners

Employment Services: Skills certification

Name: Mozilla Open Badges Implemented by: Mozilla Open Badges Funder: Mozilla Geographic Location: global	Mozilla's Open Badges initiative is working to address the issue of certification and accreditation for online education and training courses by creating a system of certification based on digital badges that can be displayed in online CVs (Knight & Casilli, 2012). Further information: http://openbadges.org/about/

Entrepreneurship and Enterprise Development: Mobile app development

Name: RLabs Implemented by: RLabs Funder: Various, including USAID and DG Murray Trust for the RLabs Academy Geographic Location: South Africa	RLabs in South Africa offers a number of services, including community development, innovation incubation, the RLabs Academy for youth, and the Kukua Fund for startup social enterprises. The community development aspect of RLabs work provides support through mobile chat advice and support services around HIV/AIDS, substance abuse, domestic abuse, stress, depression, career counseling, debt counseling, and family planning. The RLabs Academy trains youth ages 18–25 in community development, government, entrepreneurship, digital technology, social innovation, and leadership. It provides them with an opportunity for internships and to start their own businesses. The innovation incubator and accelerator provide community members with a space to develop ideas, ventures, and mentoring support from the RLabs developer and entrepreneurship network. Further information: http://www.rlabs.org/
Name: Mobile Applications Labs (mLabs) and Mobile Networking Hubs (mHubs) Implemented by: World Bank Group's infoDev, Government of Finland, and Nokia Geographic Location: mLabs (Armenia, Kenya, South Africa, and Vietnam) and mHubs (Azerbaijan, Georgia, Kenya, Moldova, Nepal, Tanzania, Uganda, and Vietnam)	The mLabs program seeks to create open spaces where mobile application developers can interact, work, and gain access to tools and expertise to assist in the creation of viable mobile application businesses. Local programmers, web designers, and mobile app developers can register as members for a low fee or for free. Each lab offers an environment that supports the development of potentially scalable mobile solutions. State-of-the-art equipment is provided to develop, test, and scale software. mLabs also provide technical training and workshops on business skills. Labs act as gateways to local, regional, and international markets and connect entrepreneurs to different types of investors. mHubs complement mLabs. They focus on supporting networking and exchange of ideas as well as mentorship and connection among various stakeholder communities. Both mLabs and mHubs are run and used by local communities with the aim of increasing the competitiveness of enterprises in mobile content and applications. Currently five mLabs and eight mHubs exist in Africa, Eastern Europe, and Asia. Further information: http://www.infodev.org/en/Project.116.html http://mlab.co.ke http://mlab.co.za http://mobilenepal.net http://akirachix.com

Name: Afrilabs Implemented by: Afrilabs Funder: Various Geographic Location: Across Africa	AfriLabs is a network of technology hubs in Africa who work together to promote the growth and development of the Africa Technology Sector. Members have worked together on the Apps4Africa contest. They have supported open collaboration spaces and sponsored the mobile apps labs in East Africa. Entrepreneurs using the AfriLabs spaces set the mandate of the spaces and build on shared experiences and good practices. There are 14 partner labs/hubs currently that are part of AfriLabs: ActivSpaces, Bantalabs, Bongo Hive, Co-Creation Hub, Hive Colab, Iceaddis, iHub Nairobi, iLabLiberia, Malagasy iHub, Meltwater Entrepreneurial School of Technology (MEST), NaiLab, RLabs, and Wennovation Hub. Further information: http://afrilabs.com/labs/
Name: Apps4Africa Implemented by: Apps4Africa Funder: US Department of State Geographic Location: Africa	The Apps4Africa competition began in 2009 as an annual program to support African social entrepreneurs who were using technology to resolve social problems. The challenge has run since 2010, The first annual prize of $15,000 had grown to $75,000 in 2012. Further information: http://apps4africa.org/2012/about.php
Name: WebGathering Implemented by: WebGathering Funder: (Information unavailable on website) Geographic Location: Africa	Africa's Technology and Innovation Hubs *Webgathering* is an online space where members and friends of Africa's hubs meet to share ideas and projects. Past topics have included engaging women and girls in technology, meeting hub directors and innovators who work in Africa hubs, linking up with the open knowledge festival to discuss "can technology drive development," operating models and funding streams for technology and innovation hubs in Africa, and the first web gathering about growing technology and innovation hubs. The group has also created a "crowdmap" to gather information about technology and innovation hubs and business incubators in Africa. Further information: http://www.africahubs.webgathering.net/

Name: AppLabs Implemented by: Grameen Foundation Funder: Various Geographic Location: Uganda, Indonesia, Ghana, Colombia	The Grameen Foundation's AppLab develops health, finances, agriculture and employment-related mobile phone-based applications, services, and business opportunities. The lab works to develop solutions that address market failures that perpetuate poverty, working closely with local and international partners to design and implement solutions. The poor are contributors to the innovation process. Grameen believes that technology and information are not the sole solution. They also train and engage members of the community to act as intermediaries to create awareness of available services, answer questions, and act as bridges to those who do not own phones or who are illiterate. Further information: http://www.grameenfoundation.applab.org/

Entrepreneurship and Enterprise Development: Small enterprise information and management

Name: Farmbook Implemented by: Catholic Relief Services (CRS) In Partnership with: Technobrain and various partners Funder: USAID Geographic Location: Zambia, Zimbabwe, Madagascar and Malawi	Farmbook is an application developed by CRS's agriculture team to support field agents helping farmers plan their businesses and evaluate productivity and profitability. It also supports management of field agents and data sharing among frontline staff and project managers. The program provides field agents with distance learning, using products such as Agilix LMS and BrainHoney ToGo, and experiential training on marketing and business planning. Trained field agents then use Farmbook to help farmers prepare business plans, calculate profitability, analyze data from a number of different farmer groups, and conduct pre- and end-of-season profit analysis for larger groups of farmers. Field agents can collect data in unconnected mode and upload to a general database shared by all project managers once they are in network range. Low-cost map and tracking functions are being developed to improve real-time data collection. The system will also be used in the future to support payments to field agents based on work plans, travel, service delivery, and performance. Further information: http://www.meas-extension.org/workshops/farmbook
Name: GoCourses Great Lakes Cassava Initiative Implemented by: Agilix Lerning Services, Cornell University International Institute for Food, Agricluture and Development, and Catholic Relief Services Funders: Gates Foundation Geographic Location: East Africa	Partner organizations developed training modules on cassava disease control, seed multiplication and dissemination, farmer group strengthening, and GPS for extension agents and other partners. These "GoCourses" were uploaded to mini-laptops (with a Windows XP systems, equipped with Adobe Acrobat) using the Internet. They were available both online and offline. Students went through the courses, completed assignments, and took exams, then connected to the Internet to upload their results. Administrators could view the grades of students remotely. Students who passed the course could begin training farmers, while maintaining continuous access to course materials. Courses were offered in French and English and face-to-face training in computer use was provided before initiating the courses. Laptops were also used to collect data on the project's impact, including farmer groups, incidence of disease, and seed distribution. Further information: http://www.ictinagriculture.org/node/130

Name: DrumNet* Implemented by: PrideAfrica Funder: Various funders Geographic Location: Kenya	The DrumNet Project delivers market, finance, and information services to agricultural supply-chain actors in Africa. DrumNet provides a networking function that simplifies and strengthens chains, so partners can easily interact and conduct transactions. DrumNet services seek to build trust across supply-chains by establishing baseline rules and promoting a common set of standards. Drumnet uses an IT platform compatible with the Internet, mobile phone networks, and other wireless devices. It allows Drumnet to offer SMS scouting, data mapping, and tailored reporting on market trends, weather, prospective partners, and related requests. The platform facilitates DrumNet's other products, including produce aggregation and post-transaction payment processing. Further information: http://www.prideafrica.com/ourwork.php#tab1
Name: Farm Radio International* Implemented by: Farm Radio International Funder: Various sources Geographic Location: East Africa	Farm Radio helps radio broadcasters meet the needs of rural small-scale farmers and their families by providing broadcasters with radio programs on relevant topics, training broadcasters to improve their services and measure the quality of their programming, and planning and delivering radio campaigns and programs on pertinent topics related to improving farmer knowledge and practice. Radio reporters and listeners use portable radios, portable recorders, and other tools. The Distance Education Program for broadcasters on scriptwriting and participatory research is mainly accessed via laptops. It is a free online training that helps broadcasters understand the steps involved in designing and creating a farmer radio program. Further information: http://ecourse.farmradio.org/
Name: The Organic Farmer Implemented by: The Organic Farmer Funder: (information unavailable on website) Geographic Location: Kenya	The Organic Farmer is a magazine for sustainable agriculture in Kenya that provides relevant, reliable, and ecologically sound information that is appropriate and applicable for farmers in East Africa. The program is in Kiswahili once per week; however, segments are available for download and re-broadcast via the Organic Farmer website. Further information: http://www.theorganicfarmer.org/about-us/

Name: Infonet-Biovision Implemented by: Infonet-Biovision Funder: Biovision Foundation, Switzerland Geographic Location: East Africa	Infonet-Biovision is an Internet-based tool for farmers, extension workers, and trainers that offers access to up-to-date and locally relevant information on agriculture, livestock, and environmentally safe technologies. The compendium is produced on CD once per year for those without Internet but with access to a computer. Farmers interested in getting the annual Infonet-Biovision CD can send 200 Kenyan shillings to The Organic Farmer in Kenya. Further information: http://www.infonet-biovision.org/
Name: FrontlineSMS Radio Implemented by: FrontlineSMS Radio Funder: Various Geographic Location: global	FrontlineSMS: Radio is developing software to assist community radio stations to interact with their audiences through SMS messaging. SMS is being used by radio stations to facilitate two-way communication with listeners. FrontlineSMS enables users to send and receive large volumes of text messages without Internet access. The platform is also newly available via web for areas with reliable Internet access. Projects are currently underway in number of countries. Further information: http://radio.frontlinesms.com/
Name: Lifelines Agriculture Implemented by: Lifelines India in partnership with Datamation Foundation Funders: CISCO, One World South Asia, BT, OneWorld.net Geographic Location: India	The LifeLines Agriculture service provides answers to 460,000 frequently asked questions. It reaches 100 villages in India and receives 350 queries per day from farmers. It is implemented on the ground in partnership with Datamation's network of field volunteers who are the point of contact for using the Lifelines service and who facilitate rural users to register their queries with the help of a mobile phone. Advice and solutions are available to farmers within 24 hours on 50+ fields of agriculture and allied activities, covering a chain of information from production to consumption, including farm inputs, funding schemes, government schemes on loans and subsidies, banking and insurance, market prices, region-specific market information, agricultural news, and organic farming. Users dial the LifeLines number from a landline or mobile phone and reach an IVR system where they are assisted in registering their query, which is stored as a voice clip in the database. A knowledge worker reviews the query to determine whether the answer is available in the FAQ database. Available answers are attached to each query in the form of a voice clip that is played back to the user when he or she calls back for the answer. If an answer is not available, the knowledge worker sends the voice query on to an expert for an answer, which is then recorded and sent to the user. Users can also retrieve the answers in text format from village information centers and can send photographs with their voice queries to get an expert opinion. Further information: http://lifelines-india.net/

Name: Esoko Implemented by: Esoko Funders and Partners: Various Geographic Location: Africa	Esoko is a technology platform that helps organizations profile people and manage information flows between them. It is mobile-enabled and cloud-based. It functions on any phone or computer without need for special hardware, and works anywhere with an SMS or data connection. It focuses on agricultural value chains with the goal of improving the transparency of markets and the operational efficiency of organizations. Using mobile phones, Esoko allows the collection and provision of content such as prices, bids and offers, weather, and agricultural tips to which users can subscribe. Esoko also provides tools that allow organizations to manage their own information and content by pushing out alerts and advisories and also tracking information such as activities, compliance and profiles. Users can keep data private or share it, and they can use other content that is publicly available from any other Esoko country. Further information: http://www.esoko.com/
Name: CocoaLink Implemented by: World Cocoa Foundation and a number of implementing partners Funder: Various Geographic Location: Ghana	CocoaLink is a mobile service that delivers farming, social, and marketing information to cocoa farmers in 15 communities in Western Ghana with the goal of improving incomes and livelihoods. Subscribers receive and share practical information via SMS text and voice messages with country experts and other farmers. Cocoalink is available to any Ghanaian with a mobile and messages are delivered in English or a local language. 100,000 messages have been delivered via CocoaLink and 3,720 subscribers are registered, 95% of whom are cocoa farmers. Forty percent of registered farmers attended community farming and literacy trainings. Eventually, the system will allow for pre-recorded messages to be sent in local languages to farmers, and farmers will also be able to speak directly with representatives, and send images and videos once trained by local infomediary partners. Further information: http://worldcocoafoundation.org/cocoalink/ http://www.candyusa.com/files/NCAJSustainabilityHershey.pdf

Name: Digital Green Implemented by: Digital Green and a number of executive and research partners Funders: Gates Foundation, Deshpande Foundation, Ford Foundation, Ministry of Rural Development of the Government of India Geographic Location: India	Digital Green disseminates agricultural information through digital media to small-scale farmers in India using pocket video camcorders to record videos. Finished videos are disseminated to community members via pico projectors. A local facilitator engages the audience through discussions and captures feedback. IVR and online/offline web-based data management and analytical tools are also used by the organization to collect farmer feedback and to measure impact. Working with almost 90,000 farmers, their partners in India have produced over 2,000 videos. Digital Green partners with existing extension systems, NGOs, and the private sector, enabling them to scale, generate trust, and leverage domain expertise. Their system is based on a "hub (district-level) and spoke (village-level)" model, whereby multiple local villages benefit from each district-level hub. Videos are locally produced using low-cost equipment. The general format of the videos is that of facilitated training where farmers and experts explain topics to the viewer. Further information: http://digitalgreen.org
Name: Mkulima Young Implemented by: Agriculture, Climate Change and Education Community Programs (ACLECOPS) Funder: Rockefeller Foundation Geographic Location: Kenya	This project aims to increase youth engagement in agricultural activities through awareness and knowledge. It uses radio and ICTs to change youth attitudes and knowledge so that youth see agricultural activities in a different light. It identifies youth engaged in outstanding agricultural entrepreneurial activities and disseminates these ideas through radio and ICT. An SMS feedback system is paired with radio programs, allowing regular feedback from target listeners to shape the programming and content development to best reflect their needs through questions and answers. The project teaches youth about the economic benefits and the potential of agriculture activities, and motivates them to try new agriculture techniques and practices. The project has an active Facebook page, accessed primarily via mobile phone, where youth can ask questions, share advice, and buy and sell products and services. Further information: http://www.aclecops.com/?page_id=80 https://www.facebook.com/mkulima.young?fref=ts

Name: Jigyasha 7676 Implemented by: Katalyst and Banglalink Geographic Location: Bangladesh	Jigyasha 7676 is a small and medium size enterprise helpline that offers information and advice to farmers in Bangladesh. 100,000 callers seek advice each month; 90% have deemed the service and information provided to be satisfactory. Jigyasha 7676 is accessible to anyone in Bangladesh using a Banglalink connection. The helpline provides information on 67 agriculture sub-sectors that is updated on a regular basis with collected, collated, and validated content. Further information: http://www.katalyst.com.bd/docs/newspieces/News_Issue_09.pdf
Name: FACET Implemented by: FHI360 Funder: USAID Geographic Location: Sub-Saharan Africa	The Fostering Agriculture Competitiveness Employing Information Communication Technologies (FACET) program looks at how ICT can play a role in improving competitiveness, lowering costs, and increasing the scale of operations. FACET provides technical assistance in these areas to agricultural sub-sectors across Sub-Saharan Africa. The project has two components: (a) knowledge sharing among missions on sustainable and scalable approaches for using ICTs to increase the success of the Feed the Future Initiative's activities, and (b) short term technical assistance to projects to help them improve their uses of ICTs. Further information: http://ictforag.org
Name: iCow Implemented by: iCow Funder: Indigo Trust, USAID, GALVmed, others Geographic Location: Kenya	iCow helps small-scale farmers to maximize their returns by better managing their cows. iCow provides support on management of cows' estrus cycles, animal health and nutrition, milk record-keeping, costs of milk production, cow diseases, feed production, and calf care. iCow allows farmers to track individual cows' estrus cycles, milking, immunizations, health, diet, nutrition, disease, production, and calves. It can be accessed by farmers via mobile or Internet. In addition to support for individual farmer management, data from iCow offers early warnings about crop and livestock disease, data on productivity, and quality assurance from product suppliers. Further information: http://icow.co.ke/

Name: mFarms Implemented by: mFarms Partners: AGRA, IFDC, International Institute of Tropical Agriculture, Image-Ad Geographic Location: Kenya	mFarms is a platform that helps different actors in the agricultural value chain communicate, maintain business relationships, and manage the flow of goods and services. mFarms supports production and purchase planning; verification of adherence to production techniques and schedules; broadcasting alerts and extension messages through text messages and interactive voice response services; and estimation of production costs. The platform consists of Java, Android, and web applications, and operates on a database that holds complete profiles (including geo-referenced locations and cell phone contacts) of each category of user or service. Using search and query, users can find locations of farmers, buyers, input dealers, warehouses, haulage companies, and sources of credit. Further information: http://mfarms.org
Name: Acopio Implemented by: Acopio Supporters: Hub Ventures, Village Capital, Agora Partnerships Geographic Location: Latin America	Acopio offers tools and services to collect, manage, and share data along the agricultural value chain, especially with coffee producers in Latin America. The application helps producer cooperatives make data-driven decisions by supporting collection and management of vital operations data using mobile phones, tablets, and PCs. This information can be shared with lenders, buyers, and other partners along the value chain. Acopio tools help cooperatives streamline processes such as collection of coffee and certification of farmers as specialty producers. Financiers can use a cooperatives' data to better understand the impact of their lending and the progress of loan recipients. Buyers can strengthen relationships with existing suppliers, identify and communicate with potential suppliers, and gain visibility into production levels on the ground. Further information: http://acopio.org
Name: TiendaTek Implemented by: Frog Design Geographic Location: Latin America	TiendaTek is a tablet- or smartphone-based system for managing a small store that enables payment via credit or debit card as well as use of barcodes. Users can track sales, products, clients, suppliers, and expenditures. Further information: http://www.tiendatekweb.com/conoce

Name: Zoona Implemented by: Zoona Investors: Omidyar Network, ACCION, Sarona Geographic Location: Zambia	Zoona is a cashless payment system designed for small-scale cotton farmers in Zambia. Zoona sends electronic vouchers to farmers' phones, which are redeemed for cash or inputs. It can also transfer money to an m-Wallet.[4] On a monthly basis, Zoona supports 50,000 transactions valued at over 3.5 million and serves over 600,000 people. Further information: http://www.zoona.co.za/default.asp?id=22
Name: SmartMoney Implemented by: SmartMoney Geographic Location: Various	SmartMoney is a third-party provider of mobile money that partners with agribusinesses. Businesses use SmartMoney to transfer funds into the mobile wallet of a buyer who can purchase crops by transferring money to the mWallet of a farmer. The farmer can cash out with a SmartMoney agent or keep the value in an mWallet for future payment. Further information: http://microlinks.kdid.org/library/ict-and-ag-profile-smartmoney
Name: IMAC Project (Informations sur les Marches Agricoles par Cellulaire) Implemented by: Catholic Relief Services Funder: Various Geographic Location: Niger	IMAC pulls price data from the Agricultural Market Information System, allowing farmers to obtain access to timely producer and consumer prices for a variety of agricultural products. The system was designed using FrontlineSMS. Producers and consumers can access price information by sending an SMS with codes indicating the product, the market, and the language (French, English, Zarma, or Hausa) to the IMAC phone number. Further information: http://sites.tufts.edu/projectabc/imac/

Entrepreneurship and Enterprise Development: Connecting to markets

Name: CellBazaar Implemented by: Grameenphone (Telenor) In partnership with: Katalyst, Thakral, BracNet, BRAC Bank Limited, Prothom Alo, The Daily Star Geographic Location: Bangladesh	Cellbazaar is a buying and selling platform that functions across Bangladesh. Launched in 2006, it allows anyone to purchase and sell in his or her region without complicated registration procedures. It is completely free to post an ad on Cellbazaar. Further information: http://www.cellbazaar.com/
Name: Google Trader Implemented by: Google Trader Geographic Location: Uganda	Google Trader functions like a *Craig's List*, listing local products and services, and allowing Ugandans to buy and sell items via their phone. It also offers services and want ads. Further information: http://www.google.co.ug/local/trader
Name: Quikr Implemented by: Quikr Funder: Backed by Matrix Partners India, Omidyar Network, Norwest Venture Partners, Nokia Growth Partners, Warburg Pincus, invested in by eBay Inc. Geographic Location: India	Quikr is a city-based classified website, available on mobile, that helps people buy, sell, rent, and find products. Free ads can be posted and replied to. Further information: http://www.quikr.com/

Name: Dialog TradeNet Implemented by: Dialog (Axiata) Geographic Location: Sri Lanka	Dialog TradeNet is a buying and selling platform in Sri Lanka, available in three languages. It offers a variety of product and service types, including electronics, tutoring, and agricultural prices in collaboration with Govi Gnana Seva. Further information: http://tradenet.dialog.lk/Default.aspx
Name: Kazang Implemented by: Saicom Geographic Location: South Africa	Kazang is a prepaid electronic vending solution that allows vendors to sell prepaid products like airtime and electricity from a Kazang-enabled device or the web. This allows vendors to avoid stocking scratch cards. Saicom's back-end platform allows vendors to prepay to avoid running out of stock. Prepaid products can then be sold using a point of sale device or via a web interface or USSD. It is available in eight African markets for Vodacom, MTN, Cello, and a number of other pre-paid services. Further information: https://www.kazang.co.za/site/home.php
Name: WiredLoop Mzantsi Prepaid Implemented by: WiredLoop Geographic Location: South Africa	WiredLoop is a prepaid service provider in South Africa for electricity, cell phone airtime, and burial insurance. It enables communities to shop where they live and expands the accessibility of prepaid electricity points in underserved areas. Products are sold through a wireless GPRS point of sale terminal. It is available in South Africa for Vodacom, MTN, Cell C, 8ta, Telkom, and Neotel. Further information: http://www.wiredloop.co.za/
Name: iPay Implemented by: iPay Geographic Location: Africa	iPay is a point of sale solution that incorporates VISA, MasterCard, Kenswitch, m-PESA, Airtel Money, and YuCash into an online transaction system so that vendors can receive payments via a website or physical shop. Users pay a commission fee for the service. Further information: http://www.ipayafrica.com/

Name: Logistimo Implemented by: Logimobile Geographic Location: global	Logistimo is a phone-based business tool for sales agents, retailers, remote inventory managers, and entrepreneurs at the base of the pyramid. The application transforms basic mobile devices into point of sale devices, order management tools, transportation dispatchers, all purpose alert appliances, and more. LogiMobile supports a majority of device types and transmits over any wireless carrier network. Users can work in Internet, SMS, or offline modes. LogiMobile uses menus, lists, numeric entry, and barcode scans for navigation and data so that even semi-literate users can manage it after a short training. Because it can function on different carriers, it can be deployed in various regions with different wireless infrastructures. Further information: http://www.logistimo.com/

Addressing Social Norms: Mentoring, training and work opportunities

Name: Jjiguene Tech Hub Senegal Implemented by: A project startup by Marieme Jamme Funder: Seeking funding Geographic Location: Senegal	Jjiguene Tech is the first women's technology network in Senegal. It focuses on supporting young women to create ideas, develop mobile apps, and start businesses. The project targets girls across Senegal who are studying "STEM" careers—science, technology, engineering, and math. It aims to nurture them, foster innovation, and provide a secure network where they can grow and begin to develop applications in French.[5] Further information: https://www.facebook.com/pages/Jjiguene-Tech-Hub-Senegal/258559404265302
Name: Girls Who Code Implemented by: Girls Who Code Funders: A variety of corporate sponsors and foundations Geographic Location: United States of America	Launched in Spring 2012, the US-based nonprofit works to close the gender gap in the technology and engineering sectors by working with high school girls and equipping them with skills and resources to pursue opportunities in computing fields. Girls Who Code's model for computer science education pairs intensive instruction in robotics, web design, and mobile development with high-touch mentorship and exposure, led by the industry's top female engineers and entrepreneurs. The program works with young women in New York City and will expand to Detroit, San Francisco, and San Jose in 2013. Further information: http://www.girlswhocode.com/
Name: Mobile Garage Implemented by: Akira Chix Funder: infoDev Geographic Location: Kenya	AkiraChix works through networking, mentorship, and training to inspire and develop a successful force of women in technology. The organization runs an IT skills training program for young women from poor urban communities. The "Mobile Garage" project supports mobile applications, business incubation, and technology entrepreneurship with university students through the creation of a social networking hub, encouraging development of mobile apps, creating an ideas competition, and starting a mentorship program. Further information: http://akirachix.com/mobilegarage.html

Addressing Social Norms: Enabling access to jobs and job tools

Name: Computer Aid Implemented by: Computer Aid Funder: various Geographic Location: global	Computer Aid works in developing countries to identify potential recipient organizations of used computers and other technological equipment. The organization receives used equipment, prepares it for re-use, and re-directs it to recipients along with training and education on its use and maintenance. Further information: http://www.computeraid.org/
Name: Sightsavers Implemented by: SightSavers Funder: various Geographic Location: global	Sightsavers supports projects which make IT accessible to blind people, often providing technology such as screen readers that allow blind people to use computers. The organization also works to support inclusive education in schools by training teachers and helping children who are blind to study in mainstream schools. Further information: http://www.sightsavers.org/

Addressing Social Norms: Behavior change campaigns

Name: mWomen Implemented by: GSMA Partners: USAID, AusAID, GSMA Association, and Visa Geographic Location: Asia and Africa	The GSMA mWomen Program aims to increase women's access to and use of mobile phones and mobile services in developing markets. mWomen was launched in 2010 as part of the GSMA mWomen Global Development Alliance in partnership with USAID, AusAID, GSMA and Visa. GSMA mWomen's objectives are to encourage industry to serve resource-poor women, increase availability of life-enhancing value-added services, and promote solutions to women's barriers to usage of mobile technologies. The program works with mobile operators, value-added service providers, and other mobile industry members, as well as non-governmental NGOs and other international development partners, to promote and support industry and development partner action to reduce the global mobile gender gap. The program focuses on resource-poor women, including those with low incomes and low levels of empowerment, those with limited access to education, and those who are socially isolated due to limited mobility or remote locations. Further information: http://www.gsma.com/mobilefordevelopment/programmes/mwomen/overview
Name: Girls in ICT Implemented by: International Telecommunications Union and partners Geographic Location: global	International Girls' in ICT Day is an initiative backed by ITU member states to create a global environment that empowers and encourages girls and young women to consider careers in ICTs. International Girls in ICT Day is celebrated on the 4th Thursday in April every year. Local partners worldwide participate in the initiative by promoting girls in ICTs through media campaigns, Take a Girl to Work Day, and other mentoring activities. Further information: http://girlsinict.org/
Name: Tech Needs Girls Implemented by: International Telecommunications Union and partners Geographic Location: global	Tech Needs Girls is an initiative of the ITU that is focused on reaching out directly to girls. A website encourages girls ages 9–18 to get involved in working in tech and to think about tech-based careers. The organizers host and announce technology prizes for which girls can compete to win funds and trips to Silicon Valley. Further information: http://www.techneedsgirls.org/

Name: Women Innovate Mobile Implemented by: Women Innovate Mobile Partners: SQL Vision Geographic Location: global	Women Innovate Mobile (WIM) is a startup accelerator that focuses on investing in mobile-first female led startup ventures. Female-founded startups typically receive less venture capital funding. The founders of WIM think women entrepreneurs in tech create a richer and more diverse innovation ecosystem. Startups accelerate their growth through seed funding, business support (office space, product development and design support, mobile-marketing promotions), and access to a network of mentors, funders, and advisors. In exchange for their investment and services, WIM receives an equity stake in each company. Further information: http://wim.co/about/
Name: Women In Technology in Nigeria Implemented by: Women in Technology in Nigeria Geographic Location: Nigeria	Women in Technology in Nigeria believes that economically empowered and technologically competent Nigerian women with increased participation are critical to improving society. The organization works in several program areas, including: grassroots women's empowerment through ICTs, green ICTs and e-waste, STEM teaching aids, STEM career fairs, women's entrepreneurship support, and child online protection. Further information: http://wim.co/about/
Name: High Level Meeting on Disability and Development Implemented by: the Broadband Commission, G3ICT, the International Disability Alliance, ITU, Microsoft, Telecentre.org Foundation and UNESCO Funder: various Geographic Location: global	In preparation for the High Level Meeting on Disability and Development, a coalition of organizations is running a global consultation to capture the recommendations on the contribution of Information and Communications Technologies (ICTs) (e.g., websites, mobile, radio and TV) to achieving the autonomous participation of persons with disabilities in all aspects of society. The consultation aims to gather input on questions such as: Why aren't best practices available to all? What challenges are limiting the uptake of ICT solutions to enable an inclusive society for all? What recommendations should be brought for consideration to the 2013 High Level Meeting on Disabilities and Development? Further information: http://www.itu.int/en/action/accessibility/Pages/hlmdd2013.aspx

ANNEX 2: Relevant Evaluations for Mobiles for Youth Workforce Development

Workforce Education and Training

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: International Youth Foundation Title: Learning Series No. 8. Equipping Youth Who are Harder to Hire for the Labor Market: Results from entra21 Executive Summary: The Role of Technology in Preparing Disadvantaged Youth for the World of Work: Findings from Three Latin American Projects Location: Latin America and the Caribbean Year: Phase 1 launched in 2001; Phase 2 launched in 2007 and ran through 2011 Donor: Multilateral Investment Fund of the Inter-American Development Bank http://iyfnet.org/document/2156 (Pezzullo, 2010a) (Pezzullo, 2010b)	The *entra21* Program was launched in 2001 by IYF in collaboration with the Multilateral Investment Fund of the Inter-American Development Bank, to improve the employability of disadvantaged youth in Latin America and the Caribbean with market-relevant training or to create decent work opportunities. Phase I included a comprehensive set of training and job placement activities. A second phase was launched in 2007, to benefit youth at higher risk from being un- or under-employed due to factors such as being rural based, disabled, or associated with violence. Phase II worked to scale up best practices validated in Phase I. Of the 14 projects in Phase II, five were selected to be part of a study that examined the effectiveness of *entra21* in helping these youth gain market-relevant job skills and become employed. Conducted over two and one-half years, the study included two site visits to each project and extensive consultations with each project team via email, webinars, and other forms of communication. During the site visits, the researcher conducted focus groups with staff and youth, interviewed key informants, and observed training sessions. To the extent possible, the researcher also engaged project leaders in the research process, tapping their knowledge to document which technologies were being used and how, and engaging them in the interpretation of the findings.	Relevant findings: ICT is a motivating factor in recruiting and retaining disadvantaged youth in short-term job training programs. Youth saw ICT as a powerful tool for creating and maintaining relationships with their peers. ICT contributed to the development of youths' basic competencies. (Trainers had to adjust to youths' low levels of formal education by providing remedial classes to increase their reading, writing, and math skills. ICTs helped make the curriculum more interesting and provided access to on-line math and literacy tools.) Technology allowed trainers to adjust more easily to differences in how quickly youth mastered course competencies. Some youth objected to a self-paced, self-instructional approach because it required more self-discipline they had been accustomed to in the formal education system. Technology helped many youth with their job seeking efforts. Young Chileans found the e-portfolio easy to use, update and share with employers. Social media enriched the training process and facilitated the management of internships and placement of youth in formal jobs. Lessons: • Job training providers in the region have not used technology extensively nor have employment offices. • A pre-training stage to enable youth who had been out of school or had a poor academic foundation to upgrade their basic skills (e.g. computer, math, and literacy) would have been useful. • Employment training needs to be adapted to the socio-cognitive characteristics of the youth (e.g., additional time for life skills and added one-on-one tutoring). • Some programs added traditional teaching into its virtual classes due to trainees' difficulty following the instructions for digital courses, assimilating new information, and learning at their own pace. • Project staff played a powerful role in modeling how to listen, communicate, manage emotions, and take responsibility as they interact with trainees and others. • An important skill for staff is to know how to develop trust and make youth feel valued. Youth-centered approaches are critical. Staff need to have the emotional maturity and skills to provide youth with personalized attention.

Workforce Education and Training, Employment Services, Entrepreneurship, Social Norms

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: Education Development Center, Inc. (EDC) Title: The Somali *Shaqodoon* Project Program: Somalia Youth Livelihoods Program (SYLP) Program Objectives: Provide Somali youth with greater access to training, internships, work and self-employment opportunities. Productively engage Somali youth and contribute to the stability and development of the region Strengthen links between training opportunities and labor market demand, and build upon existing technical training Location/Duration: Puntland, Galmudug, and South Central Somalia; Sept 2008 – Sept 2011 Funder: EQUIP3 – USAID Supporting Documentation Links: http://idd.edc.org/sites/idd.edc.org/files/EDC%20Education%20in%20Fragility%20Series-Somalia%20Shaqodoon.pdf http://www.equip123.net/webarticles//anmviewer.asp?a=665&z=123 http://www.socwe.org/file/40.pdf	The Shaqodoon program focused on increasing the access Somali youth have to training, internships, entrepreneur, and employment opportunities. There are several ways mobile technologies were employed in this program: The InfoMatch service provided by Shaqodoon gives youth up-to-date information on opportunities such as jobs, internships, and short courses posted by potential employers. Youth enroll themselves and create mini-CVs through the application. They can then search posted opportunities using their cell phones and be matched with an opportunity by SMS, online or by calling a toll-free number to an automated opportunity match service. Employers can search the database for a potential employee with the right set of skills for a job. Shaqodoon's Survey module allows schools, universities, businesses, and NGOs to send SMS surveys to trainees, program beneficiaries, and customers. These short questionnaires allow service subscribers to get key information about their constituents, particularly when they are unreachable in person. Questions are answered via SMS and answers are also fed into a web interface. Similarly, Shaqodoon provides an SMS alert system to allow quick and efficient communication with beneficiaries. Voice Alerts can be used as well, which enables non-literate beneficiaries to engage in alerts. This service can reach up to 60 registered numbers with a one-minute audio file every minute, a delivery rate of 3,600 per hour. The Interactive Audio Instruction (IAI) uses MP3 devices to deliver lessons via audio programs. Facilitators also used Shaqodoon's cellular services to lead discussions based on these daily lessons. Topics of these lessons were focused on financial literacy and entrepreneurship.	Relevant Findings: The job matching system was never fully functional, limiting the capability of the program to reach large numbers of youth. Trainees were not taught how to upload their CVs into the system, making job matching these candidates more difficult. The InfoMatch system was able to match a significant number of youth to employment opportunities more quickly than more traditional manual methods. Youths who used this system accessed and searched for opportunities using SMS an average of four times a week. Use of mobile technologies made reaching rural or nomadic populations much more effective, particularly when access to the Internet or television was limited. The use of voice alerts in place of SMS messages allowed non-literate populations to benefit from these services. Over 75% of Somalia's population is illiterate and this was an effective way to quickly reach a large number of people. MP3 players allowed for several benefits over radio. Radio faces challenges due to uneven reception and disruption in broadcast. With MP3 recordings beneficiaries could go back and listen to the lesson at a later time. MP3 players also provided programming for several different listening groups in the same area, lowering the cost per learner. MP3 files can also be tagged with additional branding information that is displayed on the MP3 player.

Basic Education and Training

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: World Reader Title: IREAD Ghana Study, Final Evaluation Report Program: IREAD Ghana Program Objectives: Give Ghana public school students access to books through e-readers. This will increase the number and variety of books and supplemental reading materials, and therefore improve student performance on standardized tests. Location/Duration: Ghana; Oct 2010 – July 2011 Funder: USAID Supporting Documentation Links: http://www.worldreader.org/uploads/Worldreader%20ILC%20USAID%20iREAD%20Final%20Report%20Jan-2012.pdf	This final evaluation report examined the initial hypothesis tested by this project. The majority of students and teachers had a positive experience with the e-readers and this technology could have a future within the Ghanaian public school system. Positive experiences were related to an increased access to books, greater enthusiasm towards reading, improved resources for teachers, improved technological skills, and an increase in the performance of students on standardized tests.	Relevant Findings: The biggest concern in the project was device breakage. Almost half of the e-readers experienced some breakage. The high rate of breakage challenges the sustainability of this solution, but with the assistance of the e-readers' producer (Amazon) this could become an inexpensive, sustainable tool for education. Loss and theft of the devices was far lower than anticipated and did not present a significant issue for the project. Students were able to share the benefits of the e-readers with friends and family, extending their impact beyond the immediate beneficiary. On average, each beneficiary had five siblings, quickly increasing the number of people benefiting from the integration of this technology. Both students and teachers were able to quickly learn how to navigate and utilize the e-readers. The use of these e-readers also increased the exposure of Ghanaian authors. Certain functions of the e-readers caused frustration, including improper use of the e-readers during instructional time and accidental book deletion. Students were able to access school materials at home, extending the opportunity for learning beyond the instructional time at school. Students could continue work on assignments and improve literacy skills faster than previously. It would be beneficial to continue integrating the use of e-readers with the existing curriculum, working with textbook publishers to produce electronic versions.

Entrepreneurship and Enterprise Development (agriculture)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: Pride Africa Title: The DrumNet Project: Lessons Learned from an ICT Initiative in Kenya's Agricultural Sector Program: DrumNet Program Objectives: Creating formal linkages between actors in Kenya's agricultural sector by creating an ICT-powered platform to facilitate cooperation between producers, buyers, agro-dealers, and bankers. Location/Duration: Kenya; Started in 2004 Funder: Pride Africa Supporting Documentation Links: http://www.prideafrica.com/assets/docs/AITEC.pdf	This project developed a platform to create linkages between agricultural producers, buyers, agro-dealers, and banks. Working across five Kenyan provinces, DrumNet worked to link two large buyers, a commercial bank, and more than 3,000 smallholder farmers. DrumNet was set up to be a commercial, self-sustaining company, which will help the platform be sustainable longer.	Relevant Findings: SMS processes worked when involved personnel used the system multiple times, clearly understood the benefit of the process, or when dedicated personnel were present. The aggregate SMS response rate never topped 40% during the agricultural season, even with no-cost SMS messages and training. Non-response was often due to: (a) phones being turned off to conserve charge without regular access to electricity for charging the devices; (b) shared handsets; (c) farmers did not understand or value the SMS response service. The farmers preferred the use of voice communication rather than SMS and were slow to accept the mobile phone as a business tool. The platform suffered due to unreliable and low-speed Internet connections in rural areas, the high cost of SMS messaging, and scarcity of mobile phones among the target groups. SMS messages are not considered legal documents, leading to dramatic delays in contracting, banking transactions, and other uses of SMS for livelihood improvement. The legal infrastructure is becoming more amenable to virtual transactions, but this will continue to pose a problem in the near future. While initially there was a high demand for DrumNet to develop an ICT solution, few had a specific idea of how ICTs could be used. One significant struggle will be professionalizing the software and reinforcing it to handle greater volume while decreasing human input.

Workforce Education and Training, Employment Services, Social Norms

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: International Youth Foundation/USAID Title: Construir Alianzas por la Juventud: Lecciones de Obra (Building Alliances for Youth: Lessons from Obra) Program: Obra Initiative Location/Duration: Jamaica, Guatemala, Peru; 2009–2011 Funder: USAID Supporting Documentation: http://library.iyfnet.org/sites/default/files/library/ObraGlobalReportENG.pdf	From 2009 to 2011, Obra, a USD $2 million initiative operated with support from USAID, worked to ensure youth at risk in the LAC region have improved access to the programs and services needed to prepare them for citizenship, work, and life. Building on foundational IYF programs such as Entra 21, Obra generated concrete opportunities for youth at risk, developed mechanisms for identifying and sharing best practices, and applied these practices in specific education and employability projects through the creation of multi-sector alliances. *Obra* brought together public, private, and non-profit partners in the sub-regions to leverage resources and disseminate best practices across the LAC region. *Obra* leveraged technology and social media to engage youth, promote the alliance, recognize partners, and advocate for youth. Using the strength of the alliance, *Obra* tapped into the communication strategies of their partners, building the technological and social media capabilities of partners throughout the region. Facebook, YouTube, and the Obra website were used to share good practices and exchange information on youth programs.	Relevant Findings: The communication strategy was one of the more powerful tools in strengthening the alliance. The use of technologies to spread information and advocate for youth brought alliance members closer together and provided them with skills for the future. Using social media was an effective way to encourage youth participation. These forums were able to engage youth and awaken interest in youth themes via the websites.

Basic Education and Training (literacy and numeracy)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: Tostan; Beltramo & Levine, 2010 Title: Do SMS messaging and SMS Community Forums Improve Outcomes of Adult and Adolescent Literacy Programs: Evidence from the Jokko Initiative in Senegal Program: Jokko Initiative Program Objectives: To develop and promote community empowerment by improving adult and adolescent literacy and numeracy skills. SMS was used to reinforce these skills and promote social interaction and empowerment. Location/Duration: Senegal; March 2009–February 2010 Funder: UNICEF Supporting Documentation: http://tostan.org/data/images/project%20jokko%20final%20report%20september%202010.pdf	The first phase of the literacy and numeracy module took place from March throughJune 2009. In late 2009, Tostan added a 150-hour cell-phone module to the literacy course, which it ran into 2010. As part of this module, Tostan provided 15 practice phones in each of the 200 villages. A Community Forum was added, allowing a community member to disseminate information to a network of peers by sending a single text message. The goal of this intervention was to increase the use of text messaging and reinforcing new skills in literacy and numeracy. Fifteen villages were selected to pilot the SMS Community Forum. During the class period, the SMS Community Forum was free to use, and cost the price of a message after that date.	Relevant Findings: Usage of text messaging rose from less than one message a week to over 10 messages per week from the baseline to the follow-up survey. This increase provides an important opportunity to practice their new literacy skills and an important incentive to care about literacy. After the initial training in cell phone usage, almost all participants understood and had used a cell phone. Usage was very low once classes were over. More experimentation is needed in how best to use this technology to promote community empowerment and ensure participation outside of class times. These was some anecdotal evidence of how the SMS Community Forum was helpful for mobilizing the community, but more research is required to make concrete findings. Although participants received occasional text messages, they usually had to find others in their household to read them. The cost and benefit of introducing the SMS Community Forum are not clear, especially given the low number of messages sent on the system in the second half of the intervention. Test scores improved substantially after the additional five months of training in text messaging and the SMS Community Forums.

Entrepreneurship and Enterprise Development (agriculture)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: iCow Title: iCow Impact Study Results Program: iCow Program Objectives: Green Dreams TECH Ltd developed iCow with the main motivation being to assist small scale farmers maximize their returns throughout their cows' lifecycle Location/Duration: Kenya; Funder: Aksent, Orange, SODNET, USAID, Safaricom, Airtel, Indigo Trust, Infonet-Biovision Supporting Documentation: http://www.icow.co.ke/blog/item/15-icow-impact-study-results.html	iCow is a mobile application designed to help farmers improve their productivity. The application allows farmers to track milking schedules, estrus cycles, nutrition, and other vital information from each cow. The application also provides information on animal health care, feed production, milk production, and nutrition. The application is customizable allowing farmers to create individual gestation calendars, milking schedules, immunization schedules, diet information, cost of production, and calf records. They also receive tailored, timely information to their mobile devices to help in their production. Farmers can access this information from their mobile phones or online.	Relevant Findings: Farmers reported an increase in income. This was due to an increase in milk yields resulting from better management of their animals. Markets for livestock and livestock by-products also increased, along with a greater number of customers. There was a decrease in the incidence of animal illness and mortality due to efficient access to information and experts. Farmers spent less on commercial feed because of increased knowledge of homemade productions, and storage of feed in preparation for droughts and dry conditions. Farmers were more prepared before purchasing a dairy cow, increasing the likelihood of a successful animal.

Workforce Education and Training (health)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: USAID, Jhpiego Title: Use of Short Message Service (SMS) in Strengthening the Quality of Health Services in Afghanistan Program: Health Services Support Project (HSSP) Program Objectives: In an effort to improve the quality of health services, HSSP developed an NGO capacity building program focusing on improvement of tools and standards, development of job aids, sharing technical information, and the provision of formal and informal trainings. Location/Duration: Afghanistan, March 2008 Funder: USAID Supporting Documentation: http://icohere-presentations.com/presentations/SHOPS2010/PDF/EH-Naimi.pdf	HSSP has incorporated systematic SMS messaging into its training protocol. These messages reinforce lessons learned and best practices for training, remind participants to implement their action plans, and allow them to practice newly acquired skills. They also provide health tips related to trainings and provide a call to action. HSSP used a post-training follow up system to ensure that participants are utilizing their new skills. As part of this process, information was collected about the SMS protocol to determine its effectiveness.	Relevant Findings: Participants said the SMS service reminded them to practice their new skills. 80% of respondents were satisfied and appreciated these reminders. 50% forwarded these SMS messages on to other colleges, expanding their impact beyond direct beneficiaries. Only 15% of respondents did not read or did not receive SMS messages. SMS is a feasible approach. Most health care providers do not have regular access to the Internet; the majority, however, do own mobile phones. This allows direct follow up after trainings. SMS complements other capacity building efforts. Used in conjunction with other approaches, this initiative reinforces best practices and training concepts. SMS provides an opportunity for partnerships: Roshan, a mobile company in Afghanistan, partnered with HSSP on this initiative.

Workforce Education and Training (health)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: USAID; Abt Associates Title: Mobiles for Quality Improvement Pilot in Uganda Program: Strengthening Health Outcomes through the Private Sector (SHOPS) Program Objectives: Using mobile phones to improve health outcomes and increase the role of the private sector in sustainable health care services. Location/Duration: Uganda; Sept 2010 – August 2011 Funder: USAID Supporting Documentation: http://www.shopsproject.org/sites/default/files/resources/SHOPS%20m4QI%20Uganda%20Pilot%20Report.pdf	This project aimed to reinforce face-to-face induction lessons, improving behavioral changes in service delivery. This pilot developed a technology-supported approach to performance improvement by creating a platform to manage and automate delivery of text message reminders and quizzes to address identified gaps in knowledge and practice. This system was also used to identify actionable topics for supervisor follow-ups. The SMS system was designed specifically for low-end phones and participants with limited or no Internet access. The pilot promoted team learning and research on questions related to the SMS messages, and an increased use of training reference materials and clinical guideline documents. The pilot also intended to orient participants through face-to-face sessions with Center and Outreach Team managers in order to cascade this service throughout staff members. However, this was not implemented due to scheduling changes.	Relevant Findings: Messages were sent and received, but technical issues resulted in intermittent periods of non-delivery. Technical problems related to modem operations, airtime loading, and message scheduling resulted in several periods of failed message delivery, but were later resolved. Troubleshooting of these technical errors required more time and resources than budgeted for within the pilot program. Post-pilot interviews with participants suggested high acceptability of text messages for performance improvement, with generally positive comments balanced by some negative feedback about message clarity and frustration with technical problems. Participants reported changes in knowledge, practice, and motivation. They reported increased staff consultations regarding text topics, instilling a culture of inquisitiveness. Formatting errors in sending reply messages could have been reduced by ensuring users were informed before receiving messages, delivering automated feedback for incorrectly formatted answers, and providing regular reminders of correct formatting. Limited prepaid airtime was a barrier to participation. The project explored the options for procuring reverse billing services, but mobile service providers indicated that it was not available. The mobile learning platform developed in this pilot was not well suited for large data collection or management, which would require the use of more complex smart phones. Instead, the platform was designed to integrate with existing training and educational programs. The 160 character limit of SMS messaging would not be suited to present comprehensive content, which could be delivered through web-based e-learning tools.

Basic Education and Training (literacy)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: UNESCO Title: Literacy Promotion through Mobile Phones Program: UNESCO Literacy Project Program Objectives: Literacy training and reinforcement; building youth confidence; using mobile phones to reinforce these goals. Location/Duration: Pakistan Funder: UNESCO Supporting Documentation: http://unesco.org.pk/education/documents/Project%20Brief%20Paper_ICT.pdf	This project is concerned with the problem of literacy retention among youth. It aimed to motivate youth to continually consolidate their literacy skills. The key idea of this project was to use mobile phones as a tool for delivering post-literacy training materials to youth. Messages contained pedagogically correct, fun, and interesting materials. SMS messages were used to reinforce lessons learned at the Learning Centers. To monitor the progress of the learners, they were given monthly examinations to assess their literacy skills. In one area, there were no learners who scored an *A* at the beginning of the program; by the end, 39% scored an *A* —showing marked improvement.	Relevant Findings: At the beginning of the program, families of the learners had a negative view. They believed that adolescents should not have mobile phones and doubted the effectiveness of such a program. By the end of the program, 87% of respondents had a positive attitude and believed in the effectiveness of the approach. Gaining the trust of communities is an essential component of the success of such projects. Because SMS messages are limited to 160 characters, longer messages had to be split into multiple messages. The use of the English alphabet was forbidden during the literacy course in order to familiarize students with the Urdu alphabet. But typing Urdu on a mobile phone keyboard can be difficult and time consuming. Because of this, participants would use the English keyboard to send messages. This program built enthusiasm and confidence within learners. This confidence was bolstered by both improved literacy skills and forming greater connections between each other and with information sources. Having mobile phones made the participants feel more secure. They now had a tool to communicate with relatives in case of emergency situations. This aspect was not anticipated in the initial program design. Participants began sharing lessons with other members of their households, including younger daughters and mothers. In some instances, mothers began attending the learning centers with their daughters to improve their literacy.

Basic Education and Training (literacy)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: Catholic Relief Services Title: ABC, 123: The Impact of a Mobile Phone Literacy Program on Education Outcomes Program: Project ABC Location/Duration: Niger, Feb 2009 – June 2010 Funder: USAID Supporting Documentation: (Aker et al., 2010).	Catholic Relief Services developed a curriculum to incorporate mobile phones into the existing adult literacy and numeracy programs. Classes focused on basic literacy and numeracy in the local language of the village (either Zarma or Hausa) during the first year, and functional literacy topics during the second. Participants in the Project ABC villages received the same training as the traditional literacy and numeracy curriculum with two alterations: (a) training in how to use simple mobile phones – sending and receiving texts and calls, and (b) provision of mobile phones.	Relevant Findings: The relatively cheaper cost of SMS as compared with voice services in some countries provides a financial incentive to use SMS, increasing the demand for literacy skills. Even without SMS skills, using mobile phones for voice calls appears to provide a modest improvement in numeracy. These results could potentially by sustained without village-level libraries or local language newspapers.

Workforce Education and Training (literacy)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: International Youth Foundation Title: Building on Hope: Findings from a Rapid Community Appraisal in Jordan Program: Youth: Work Jordan Program Objectives: This initiative seeks to improve the life and job prospects of highly vulnerable youth. The goal is to improve and expand community-based social services with an overarching focus on promoting the employability and civic engagement of Jordan's youth. Location/Duration: Jordan Funder: USAID Supporting Documentation: http://library.iyfnet.org/sites/default/files/library/YWJ_RCA_Full.pdf	Young people in the communities served by this program recognized the social value of formal education, but did not see the practical value. Formal education only provides some practical and life skills they need to work. Many young people in these communities had a low level of education, drastically reducing their chances of getting employment. Vocational training is a reasonable alternative to other types of education, but there are negative stereotypes that dissuade youth from this path. Gender roles also limit the number of girls pursuing vocational education. While employment opportunities are available, companies state that the youth do not have the technical or "soft" skills required for these jobs. Providing the technical, life skills, and entrepreneurship training will help resolve this gap. Holistic career counseling is also needed to help youth identify sectors with opportunities, and paths that will lead to long-term careers.	Relevant Findings: ICT was identified as a sector with high potential for employing a high number of youth, particularly in call centers and business process outsourcing. Existing employment services in the country do not use technology effectively, and lack up-to-date information about job opportunities. Youth: Work Jordan worked to improve the use of technology to provide the most recent opportunities.

Workforce Education and Training

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: Education Development Center Title: EQUIP3 Lessons Learned: Experience in Livelihood, Literacy and Leadership in Youth Programs in 26 Countries Program: EQUIP3 Program Objectives: This program was designed to improve earning, learning, and skill development opportunities for out-of-school youth in developing countries. Location/Duration: 26 countries; 2003–2016 Funder: USAID Supporting Documentation: http://theyouthalliance.org/node/177	The evaluation does not consider the mobile component—Paje-Niéta—of this program in any real depth. However, the evaluation gives a good overview of the youth development and youth livelihood programming. Technology has become a significant consideration for livelihood and employment strategies and a tool for program and content delivery. Advances in technology during the existence of the EQUIP3 program, have been remarkable and have been incorporated into the program design in its later stages. Low-cost, high-quality technology provides a delivery system, which can provide access to skills and job information for hard-to-reach, informally organized populations as well as more cost-effective monitoring and evaluation. As this program is ongoing, other mobile components are likely to be implemented in the future. Paje-Niéta integrates appropriate information technologies in support of linkages that improve youth livelihoods, through agriculture market information, workforce opportunities, and job networking. It also enhances instruction and learning through the introduction of cell-phone based multimedia lessons. Multimedia applications pre-loaded on mobile phones provide alphabetic, numeric and phonetic lessons, as well as math drills and quizzes.	Relevant Findings: The use of mobile phones helps empower youth by placing them in charge of their own learning and development.

Workforce Education and Training (health)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: African Medical and Research Foundation (AMREF) Title: Report on Evaluation of the Utilisation of Competencies Gained from the Kenya Nurse Upgrading Programme Program: Kenya Nurse Upgrading Program Program Objectives: To improve the standards of nursing care and to equip nurses with the skills to manage new and re-emerging diseases through a blended learning solution. Location/Duration: 108 Centers in 8 provinces in Kenya from 2000-2010. Funder: USAID Supporting Documentation: (African Medical and Research Foundation, 2011)	The report assesses how effectively learners apply what they have learned through the blended learning courses. The evaluation set out to: Assess if nurses, both current eLearners and graduates, are transferring the newly acquired skills, knowledge, and attitudes to their everyday work arena Assess if there was significant and measurable change in performance of the graduates when they get back to their jobs Determine if there were any barriers (e.g., managerial, organizational, incentives) that prevent the students from applying part or all of what they are learning to their jobs The study was conducted with 205 nurse graduates (73%) and learners (27%), and their supervisors. Qualitative and quantitative data were collected.	Relevant Findings: The distance learning Nurses Upgrade program was an effective way of upgrading the skills of nurses especially in poor resource settings Learners utilized multiple media for learning, though mainly eLearning and print media, despite having registered to use one form of media. The pace of enrollment had slackened in 2008 but seemed to be picking up in 2010. General Nursing was the biggest beneficiary of the program with 80% improvement in performance. Mixed media of learning should be availed to suit the needs of the learners. There is a need to address the small minority whose performance and utilization of skills were low and identify the reasons for this performance. There was also a need to promote sustained performance and skills utilization once the learners graduated from the program. Government and other stakeholders need to have policies in place to address barriers to skills utilization in terms of improved infrastructure, equipment and motivational factors.

Basic Education and Training

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: International Youth Foundation Program: BridgeIT Program Objectives: Improve the quality of teacher instruction and primary school achievement in math, science and life skills by leveraging mobile phone technology. Location/Duration: Philippines & Tanzania; 2007–2012 Funder: USAID Supporting Documentation: http://www.iyfnet.org/bridgeit https://edutechdebate.org/meducation-initiatives/bridgeit-empowering-teachers-with-video-via-mobile-phones/	Teachers were provided with a digital catalog of educational videos, typically four to seven minutes long, which are downloaded from a server using a mobile phone. This phone can be connected to a television in the classroom in order to display the video to the students. Each video is accompanied by a lesson plan. Principle Findings: Test scores of students in BridgeIT and BridgeIT+ Life Skills in both math and science showed significant gains during the program. Students in BridgeIT schools scored on average 10 to 20 points higher than students in non-BridgeIT schools. There were no significant differences between girls and boys. While the overall scores of girls were lower than boys, no statistically significant difference was found. Girls also benefited from after-school tutoring, adaptation of course materials to be more relevant for girls, and special training for teachers.	Relevant Findings: Most of the 5th and 6th graders felt that the video lessons were boring when asked at the beginning of the year; both groups of students drastically changed their attitudes after nearly a year of using the lessons. Overall, the percentage of students who felt that the videos made math and science easier to understand increased by about 10–20% over the one-year period. It appeared that the Life Skills program was having a positive effect on attitudes towards entering the workforce after primary school Classroom visits observed improvements in student-teacher behavior and interaction, most notably, children (both boys and girls) were asking more questions, and there was an increase in children who needed help receiving the needed help from both teachers and peers. Very few teachers were observed communicating in a local language other than Swahili and there has been a large increase in teachers encouraging silent students to participate in the class by calling on them more often. Also, there has been an increase in the number of teachers who know their students by name (often a challenge in Tanzanian schools where class sizes often range from 60–100 students). Quality use of videos increased over the project life span. The number of teachers using video lessons, preparing students for the lesson, and offering activities related to the video lessons increased in both the BridgeIT and the BridgeIT+LifeSkills classrooms. Based on regression analysis, the single item that significantly affected test scores in a positive manner was whether the teacher helped students understand the video lessons.

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: EDC Title: Technology in the HP Life Entrepreneurship Program: Summary Report Findings Program: Hewlett-Packard Learning Initiative for Entrepreneurs (HP LIFE) Program Program objectives: (Project Summary: The HP LIFE program is designed to assist micro-entrepreneurs in expanding the potential of their businesses by providing them with training on information and communication technology (ICT) skills together with business skills. Location/Duration: 340 training centers in 49 countries across the globe. The evaluation covers China, India, Kenya, Nigeria and South Africa programs. Funder: USAID-funded EQUIP3 Leader Award; primed by EDC and implemented with a consortium including the International Youth Foundation and FHI 360. Supporting documentation links: http://idd.edc.org/sites/idd.edc.org/files/Technology%20in%20the%20HP%20Life%20Entrepreneurship%20Program%20-%20Summary%20Report%20Findings.pdf (EQUIP3, 2012a)	The evaluation focused on testing two underlying assumptions regarding ICT tools on which the HP LIFE curriculum is based: Assumption 1: Increased application of ICT tools or software leads to improved employment and entrepreneurship outcomes among disadvantaged youth in developing countries. Assumption 2: Technology-based tools, such as online training content and games, increase program effectiveness. To test these two assumptions, EDC conducted process and outcome evaluations of the HP LIFE program. The *outcome evaluation* was conducted to test the first assumption of the LIFE curriculum and sought to answer the following questions: 1. To what extent do graduates of the HP LIFE program experience increased incomes and other benefits as a result of the training? 2. To what extent do graduates of the HP LIFE program use the ICT tools in their business, employment, or search for employment? 3. To what extent did the ICT tools prove to be relevant to the businesses youth created or employment they found? The study's *process evaluation* tested the second assumption that technology-based tools used as part of youth workforce development curricula increase program effectiveness by asking the following questions: 1. How relevant do youth trainees find the HP LIFE curriculum and online tools to their needs for starting or strengthening micro-businesses or finding employment? 2. How effective is the use of technology in transferring skills and information to youth trainees? The evaluation was conducted from November 2011 through April 2012 in China, India, Kenya, Nigeria, and South Africa. (Vinogradova, 2012)	Relevant findings: The HP LIFE program was found to improve participant outcomes through improved ICT skills in terms of income, employability, and the efficiency of business operations. Both business owners and employed HP LIFE trainees reported small to moderate increases in income, including some over 20%, as a result of their participation in the training. The HP LIFE participants gained more than ICT skills from the training. Participants reported increase in income along with key benefits, including mentoring, interaction with other trainees, encouragement from trainers, and improvements in their own communication skills. Basic ICT skills were the most helpful to employed youth and micro-business owners, while more advanced ICT skills were not considered essential to their job or business. Face-to-face instruction with computer-based support was the most beneficial mode of instruction. Face-to-face instruction was an effective mode of instruction for all respondents, followed by practical exercises using computers. The online program components did not work as well in developing countries due to poor electricity and Internet service infrastructure and unavailability of computers. The importance of non-ICT benefits of the training to the participants, such as improved self-confidence, suggests an additional reason why the face-to-face mode of delivery was found to be effective. Mentoring and encouragement were cited as important factors for female trainees in particular. While both men and women said that they benefited from the encouragement, mentoring, and interactive aspects of the training, these were found to be especially important for women.

Demand-Side, Entrepreneurship and Enterprise Development (cash transfers)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: World Bank Title: Employment Generation in Rural Africa: Mid-Term Results from an Experimental Evaluation of the Youth Opportunities Program in Northern Uganda Program: Youth Opportunities Program Location/Duration: Northern Uganda Funder: The World Bank Supporting Documentation: (Blattman, Fiala, & Martinez, 2011) https://www.poverty-action.org/sites/default/files/blattmanfialamartinez.midtermreport.pdf	The study aims to answer the questions: Can cash transfers promote employment and reduce poverty in rural Africa? Will lower unemployment and poverty reduce the risk of social instability? It evaluates one of Uganda's largest development programs which provided thousands of youth nearly unconditional, unsupervised cash transfers to pay for vocational training, tools, and business start-up costs.	Relevant findings: Despite a lack of central monitoring and accountability, most youth invest the transfer in vocational skills and tools. The economic impacts of the transfer are large: hours of non-household employment double and cash earnings increase by nearly 50% relative to the control group. The evidence suggests that poor access to credit is a major reason youth cannot start these vocations in the absence of aid. These economic gains result in modest improvements in social stability.

Demand-Side, Entrepreneurship and Enterprise Development (cash transfers)

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Source: World Bank Title: Credit constraints, occupational choice, and the process of development: Long run evidence from cash transfers in Uganda Program: Youth Opportunities Program Location/Duration: Northern Uganda Funder: The World Bank Supporting Documentation: (Blattman et al., 2013) http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2268552	The evaluation covers a large, randomized, relatively unconditional cash transfer program in Uganda that was designed to stimulate such structural change. Researchers followed thousands of young adults two and four years after receiving grants equal to annual incomes. Most started new skilled trades. Labor supply increased 17%. Earnings rose nearly 50%, especially women's. Patterns of treatment heterogeneity were consistent with credit constraints being relieved. Constraints appeared less binding on men, as male controls caught up over time. Female controls did not, partly due to greater capital constraints. The study goes beyond economic returns to look for social externalities. Poor, unemployed men are commonly associated with social unrest. Governments routinely justify employment programs on reducing this type of risk. Despite huge economic effects, researchers found little impact on cohesion, aggression, and collective action (peaceful or violent). This finding challenges a body of theory and rationale for employment programs, but suggests that the impacts on poverty and structural change alone justify public investment.	Relevant findings: The bias against cash transfers for youth/vocational training is unwarranted. There were high returns to cash transfers even among poor, unemployed, and relatively uneducated women that lasted over time. Availability of start-up capital is essential. Unconditional cash transfers have great potential to improve the lives of the poor.

Demand side (cash transfers) Social Norms

Evaluation Information	Summary of the evaluation	Relevant findings for mYWD
Title: Technology for employability in Latin America: Research with at-risk youth and people with disabilities Program: Unlimited Potential Community Technology Skills Program Program objectives: Conduct research in select countries in the region on the impact of basic information technology skills training on the disabled and at-risk youth populations. Location/duration: Brazil, Ecuador, Guatemala, Mexico, Venezuela Funders: Microsoft Community Affairs under the Unlimited Potential Community Technology Skills Program; Trust for the Americas through the POETA initiative Supporting documentation: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0CEYQFjAD&url=http%3A%2F%2Fg3ict.org%2Fdownload%2Fp%2FfileId_810%2FproductId_149&ei=mGGjUezDN4S60AHnjIH4DQ&usg=AFQjCNFbA5VsXA0H1Tv5OtJ12IMea8sDdA&sig2=FJX1M-HRKoIoZIs_r8KrmQ&bvm=bv.47008514,d.dmQ (Pal et al., 2009)	The study reviews programs that provide basic computer training for people with disabilities and at-risk youth. Based on primary research in five countries—Brazil, Ecuador, Guatemala, Mexico, and Venezuela—it discuss the landscape of issues around technology and employability and investigate how ICT training impacts the employability concerns of two populations with diverse needs and histories of social and economic exclusion. Findings are broadly divided into three segments: (a) the environmental factors that impact such projects, including the aspirational environment and the discourse of technology; (b) the short-term impacts of these programs, including the creation of pathways to employment and community-building, the impacts on self-esteem and stigmatization, and the potential of mismatched employment expectations resulting from access to these programs; and (c) factors that influence the success of such programs including cost, certification, and accessible technology.	Relevant findings: Technology training programs can play a role in building community and in helping people with disabilities build economic and social networks; technology centers can be created as “safe spaces” for people with disabilities. Interviews indicated that a significant proportion of attendees at technology centers for both at-risk youth and people with disabilities, were able to find employment. However, due to sampling biases and the lack of available data on graduates as well as dropouts from the programs, it was not possible to estimate an accurate rate of employment for entrants into the program. Enablement was central to reducing disabled respondents’ sense of stigma. In interviews, participation in the labor market emerged as a particularly important factor in this regard; it enhanced the visibility of people with disabilities in new occupations, working against widespread social stereotypes about the kinds of jobs open to people with disabilities.

ANNEX 3: Relevant Research for Mobiles and Youth Workforce Development

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
2010 Active Labor Market Programs for Youth (The World Bank, 2010)	This is a how-to guide for a four-step process for supporting unemployed youth: (a) identifying the target population and constraints for finding jobs, (b) selecting the interventions that correspond to the constraints, (c) adjusting the design according to country and target-group factors, and (d) evaluating program impact.	Only a small set of programs were included due to the limited availability of rigorous evaluations of active labor market programs for youth (ALMPs) in developing countries. A common concern is the self-selection process of participants. Unobservable characteristics like motivation may impact the results of evaluations.	The findings identify possible ALMPs that can help overcome employment constraints for youth. Job-relevant skills constraints can be mitigated by: Evidence-based interventions such as information about the value of education, *training plus* comprehensive programs, and information on returns to technical specialties Mixed evidence, theoretically sound interventions such as second-chance programs, on the job training, behavior-skills training, and entrepreneurial training. Lack of labor demand can be mitigated by: • Evidence-based interventions such as wage or training subsidies, affirmative action programs, and employment services • Mixed-evidence, theoretically sound interventions such as public service programs, labor-intensive public works, subsidies to employers who hire target groups, and employee mentoring • Job search constraints can be mitigated by: • Evidence-based interventions such as employment services • Mixed-evidence, theoretically sound interventions such as technology-based information sharing, skills certification, and training center accreditation • Firm startup constraints can be mitigated by: • Evidence-based interventions like comprehensive entrepreneurship programs • Mixed-evidence, theoretically sound programs like microfinance • Social constraints on the supply side can be mitigated by: • Evidence-based interventions, e.g., targeting excluded groups participation in programs, non-traditional skills training, and safe training and employment spaces • Mixed-evidence, theoretically sound programs like adjusted program content and design to account for excluded group's specific needs.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Youth, mobility and mobile phones in Africa: findings from a three-country study http://www.tandfonline.com/doi/abs/10.1080/02681102.2011.643210 (Porter et al., 2012)	The paper explores the use and perceived impacts of mobile phone penetration among young people in three Countries (Ghana, Malawi, and South Africa).	Young people, between 9–18 years old, at 24 research sites were given a survey questionnaire. Research sites included both rural and urban neighborhoods. In each site, qualitative studies were conducted between 2006 and 2009, and included young people, teachers, parents, and other key informants. Results of this research were then compared across settlement types (rural vs. urban), country, age group, and gender. The report considers the potential connections among young people's phone usage, virtual and physical mobilities, and broader implications for social change.	Use of mobile phones among young people is related to the comparative wealth and development status of the country. More young people in South Africa use mobile devices than in Malawi. Almost all phones used by young people are mobile phones, not landlines. However, most of the phones used are owned by another household member and borrowed by the young person. Many young people aspire to own a mobile phone, but this hope was attainable only in the more developed country—South Africa. It has been reported in a diverse context that mobile phones have been used to lure, entice, or control young women and girls. This finding came out in qualitative transcripts, primarily based on precedent rather than actual experience.
Strengthening Rural Livelihoods: The Impact of Information and Communication Technologies in Asia. http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/04/strengtheningruralliveli-hoods.pdf (Grimshaw & Kala, 2011)	This book pulls together six research studies that focus on illustrating the role of ICTs in international development more broadly.	Each case study outlines the strengths and weaknesses of the particular research methodology. All but one employed a form of control trial.	Cultural context and barriers to women must be taken into consideration when designing programs. Trust must be established through intermediaries and transparency before women will feel comfortable using ICT services in some contexts. Extra steps had to be taken in order to reach women who have limited opportunities to travel away from their villages.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
mLearning: A Platform for Educational Opportunities at the Base of the Pyramid http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/04/mlearningaplatformforeducationalopportunitiesatthebaseofthepyramid.pdf (GSMA Development Fund, 2010)	This report documents the current landscape of mobile learning in the developing world, looking at findings from past interventions and suggesting possible paths going forward.	Case studies are used to illustrate the overall findings of this paper. These case studies are from several different contexts and highlight important characteristics of successful mLearning programs.	More successful mLearning programs directly addressed identified community needs. Content must be entertaining, relevant, and local. mLearning should be looked at as a business and modeled as such. Using existing technologies will be more effective than trying to implement programs using smart phones or sophisticated technologies that do not exist in the community. mLearning programs are occurring all around the world, though many are small scale and not well documented.
Shaping the Future: Realizing the potential of informal learning through mobile http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/05/mLearning_Report_230512_V2.pdf (GSMA Development Fund, 2011)	This research explores the role mLearning has on education and career development of young people. The report outlines best practices and opportunities to implement mLearning in developing countries.	Along with research into mLearning programs, GSMA interviewed experts in the field and industry from four countries and conducted more in-depth research in South Africa, which was chosen because of its relatively developed mLearning environment.	A good career is a high priority for young people, but many feel a gap between their skills and education, and their long-term career goals. Enthusiasm for learning, and mLearning in particular, increased when mobile data and content was demonstrated. mLearning should be linked back with other interests of young people including sports, music, and informal social activities. The target audience should also include families and other *gatekeepers* to demonstrate the value and potential of owning a mobile handset.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Improving Literacy in Rural India: Cellphone Games in an After-School Program (Kam et al., 2009)	Educational games on cellphones hold the promise of making learning more accessible and enjoyable. The paper is a pilot study of an educational mobile phone game to support literacy. It took the form of an after-school program in a village in India. This paper reports on the summative learning assessment.	Language acquisition is a long-term process on the learner's part. With a novel technology solution that has yet to be institutionalized, there were tremendous logistical obstacles in running a pilot study over a non-trivial duration. The paper describes the results of a semester-long pilot study—the longest so far in this project—which took place during the project's fourth year. The study involved 27 rural children who participated in an after-school program implemented in their village.	Participants (both high-gains and low-gains learners) in the after-school program exhibited statistically significant post-test gains that could be reasonably attributed to the cellphone-based English learning games. Learning benefits were uneven among participants. High-gains learners outperformed low-gains participants on the pre-test, qualifying test, and Hindi literacy test. The results suggest that the cellphone, which remains a relatively scarce resource in the developing world, is most effectively utilized in an after-school program that targets more advanced children. Children's tendency to seek help from their neighbors can be channeled productively if the latter are taught to offer help appropriately (e.g. instead of only telling their neighbors the correct spelling, help them to associate and remember the correct spelling). Peer coaching strategies are especially crucial since cooperative group learning is unfamiliar to many rural children, whose schools (if they attend one) are more likely to implement rote learning.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Transforming learning through mEducation http://mckinseyonsociety.com/downloads/reports/Education/mEducation_whitepaper_April%201_vFINAL.pdf (McKinsey & Company & GSMA Development Fund, n.d.)	This white paper provides an overview of the mEducation landscape and its potential value to the mobile network operators. McKinsey quantifies the size of the mEducation opportunity for MNOs: a possible four billion in revenue in connectivity; $20 billion in enabling the mEducation ecosystem; and $70 billion if MNOs invest up front and lead as end-to-end mEducation providers.	A combination of top-down and bottom-up approaches used to estimate the mEducation market opportunity overlaid with an analysis of geography, education segments, and products to refine and clarify estimates. The authors also considered the "technology-addressable spend"—the components that can be replaced by technology in the near future, such as instructional material, IT infrastructure, and private tutoring. Considering differential device penetration in the different starting regions, the authors downsized the technology addressable spend using the current mobile feature phone penetration across geographies as a proxy for technology readiness. They then used the estimate of global addressable market and bottom-up mEducation revenues to estimate adoption rates across regions. To forecast future adoption rates, the authors looked at the historical adoption curves of similar technologies, such as digital music, PCs, and mobile phones.	mEducation offers three advantages with the potential to improve education delivery and enhance learning outcomes: • Simplifies access to content and experts, overcoming time and location constraints • Personalizes education solutions for individual learners and helps educators customize teaching • Improves efficiency Five trends create a fertile environment to support mEducation growth: • Portable devices are evolving, increasingly available smartphones open costs and possibilities • Digital natives adopt mobile solutions quickly and this will become the norm • Country governments are seeing the potential for schools and investments to improve learning outcomes • Mobile apps are becoming increasingly popular and users are downloading them at higher prices than entertainment and gaming apps • Pilots are leading to viable products with commercial success that is attracting more investment in mEducation providers McKinsey outlines seven product and solution archetypes for MNOs • Educational e-books and courses accessed through portable devices • Learning management systems and authoring tools • game- or simulation-based learning tools • Collaboration tools • Adaptive assessment services • Test preparation support • Distance tutoring and homework support

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Technology Teaching and Learning. Research, Experience and Global Lessons Learned http://idd.edc.org/sites/idd.edc.org/files/Technology%20Teaching%20and%20Learning%20-%20Research,%20Experience,%20&%20Global%20Lessons%20Learned.pdf (Education Development Center, 2012a)	This research examines educational technology initiatives in Lebanon, Jordan, the United Kingdom, and the United States over the past decade, drawing lessons for educational technology initiatives. Chapter Two has specific information on mobile technologies, including MP3/MP4 players, cell phones, smart phones, e-readers, tablets, probeware, and graphing calculators.		For newer technologies such as smart phones and tablets, there is little or no existing research proving their utility as a teaching and learning tool. Technology can compensate for poor teacher quality. Exposure to ICTs increases the cognitive ability of students, allowing them to learn faster. Technology can benefit special populations, especially learners with special needs. Technology is most successful as part of an overall focus on teaching and learning. Content, instruction, assessment, plus sound policies, practices, and support matter far more than the technology alone. Technology is beneficial when it is developmentally appropriate for the students who use it. High school students benefit from generic technology, while primary students benefit from subject-specific applications. Students who work in groups at the computer have been found to interact more with their peers, use more appropriate learning strategies, and persevere more on instructional tasks. Students who work individually spend more time engaged with the software and complete their assignments more quickly. Technology is most beneficial when it is coupled with best practices in instruction and assessment. These include learner-centered, inquiry-based, or problem-based instruction; deep questioning techniques; peer instruction; diagnostic assessment to tailored instruction; and learning tools based on students' level of understanding.

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Skills for Employability in Africa and Asia. http://www.resultsfordevelopment.org/sites/resultsfordevelopment.org/files/resources/ISESE%20Skills%20Synthesis_Final_0.pdf (Burnett & Jayaram, 2012)	The Innovative Secondary Education for Skills Enhancement (ISESE) project seeks to identify the skills required for work in the 21st century economies of Africa and Asia, and to explore innovative models of delivering these skills to youth of secondary school age. Results for Development (R4D) worked with regional partners in both regions to uncover new findings, and also scanned existing research and work in this area. This synthesis paper summarizes the background studies on skills for employability that were produced as part of this research, and complements a parallel synthesis paper exploring innovative models for skills enhancement at the secondary level. This paper focuses on two key questions for sustainable livelihoods: -What are the skills needed for employability in developing countries, especially in Africa and Asia? -What skills do students and secondary school leavers currently possess?	12 focus countries were selected in each region for the research, covering Francophone Africa, East Africa, South Asia, and Southeast Asia.	Technical skills are important in both the formal and informal economies, but non-cognitive skills may be more important in the informal economy. Most informal workers are self-employed and need to be able to work along the entire value chain. Most informal workers do not have a secondary education and those who do have not acquired the crucial non-cognitive skills. The primary training available to informal workers is through apprenticeships and not through the formal school system. However, apprenticeships may be “too practical” in the sense that they do not provide the necessary non-cognitive skills required for success. Employers seek cognitive, non-cognitive, and technical skills. Technical skills at the secondary level are only useful if they are very closely related to short-term demand in the labor market. General technical skills cost more to provide than general academic secondary skills, with no higher returns to individuals or the economy. Having transferable skills—being able to apply existing skills in a new context—is particularly important in a dynamic and fast-paced job market. Proportionally, more women are employed in the informal sector than the formal sector, and girls are less inclined to pursue science, mathematics, and other technical skills.

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mLearning Research Uganda, Preliminary Findings (Dawes & D'Elia, 2011b)	A field survey was conducted to better understand how youth in Uganda use their mobile phones, how they value them, and their interest in accessing different youth employment and educational content via mobile phones.	Data collection included expert interviews, in-depth interviews, focus groups, quantitative surveys, and mobile surveys over a four-week period in 2011. 1,000 mobile data users were surveyed. The majority were male (87.5%) and 85% had a secondary education or higher.	Youth workforce development issues are structural. There is a gap between theoretical schooling and the skills needed to enter the job market. Financial literacy and customer care concepts are low. Jobs are mostly found via word of mouth. Conmen are an issue that makes people mistrustful. Youth would like to receive skills development and other education content on their mobiles. Job search, internship opportunities, career advice, and interview techniques would be useful to them. The preferred ways to learn via mobile were: Internet (77%) and SMS (52%), Voice (38%), social networking (35%), and apps (25%).
Skills are not binary: Nuances in the relationship between ICT skills and employability. (R. Walton, Putnam, Johnson, & Kolko, 2009)	Kazakhstan serves as a case study in this paper. It considers the links between ICT skills and employment in transitioning economies.	This project was a four-year longitudinal study of ICT use. Surveys and Interviews were the primary means of research with a sample size of over 1,000.	ICT skills can be a predictor of employment status, and may indicate a higher level of income. This is true even for basic computer literacy. Employability in some developing world contexts does not require advanced computing skills. These skills are especially important when combined with a higher level of education.
Performance factors of mobile rich media job aids for community health workers http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3116248/ (Florez-Arango, Iyengar, Dunn, & Zhang, 2011)	The paper describes a randomized prospective controlled study on the performance of community health workers (CHWs) in Colombia, when using interactive structured rich media (text, audio, images/video) clinical guidelines on cell phones to diagnose and treat pediatric and adult medical conditions in a simulated setting.	The system described provides information and guidance using audio, images, and video. The authors conjecture that the study results would persist. Further research with CHWs and patients across a range of educational levels is needed.	Principal results included a statistically significant decrease in error rates (33.15%) and an increase in protocol compliance (30.18%) of the intervention versus control. Study subjects had completed high school. In some countries, CHWs have lower educational levels and serve populations that have very poor literacy, especially among women. Even in such countries, cell phones have achieved widespread acceptability. These results indicate encouraging prospects for mHealth technologies in general and the use of rich media clinical guidelines on mobile phones in particular, to support global health. Potentially, the long-term result from using such systems could be improvements in patient health outcomes.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Effective In-Service Training Techniques, Timing, Setting and Media https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CDIQFjAA&url=http%3A%2F%2Freprolineplus.org%2Fsystem%2Ffiles%2Fresources%2FFINAL_Technical%2520report_PRINT_0.pdf&ei=eRchUeapOsHLqgHQ0oHYAw&usg=AFQjCNHxmMy-SLbUXKOyti-YTW5IuSWOEJw&sig2=D_zZ1qu5qiakiy89nLw2TA&bvm=bv.42553238,d.aWM (Bluestone et al., 2012)	This literature review summarizes the effects that educational techniques, timing, setting, and media have on learning outcomes and subsequent practice behaviors. This review provides evidence to guide best practices for the design and delivery of continuing education programs.	A wide range of literature relating to this subject was consolidated and evaluated based on a conceptual framework for Continued Professional Education developed at Johns Hopkins University.	Educational techniques are still the most important factor for learning outcomes. Techniques that involve the learner in the material are much more effective than passive learning techniques. How the training was delivered (in person or via computer) was less important than the technique used for the training. No difference was found between training done in the work place and training done in a simulator. The media used for training should be chosen to support the training techniques being implemented. Mobile devices have been shown to increase compliance with learned material by providing high frequency learning and reminders.
An exploratory study on the use of camera phones and pico projectors in rural India. (Mathur, Ramachandran, Cutrell, & Balakrishnan, 2011)	This paper explores the potential use of camera phones and pico projectors as a means of creating and utilizing digital context in rural India. Both educational and healthcare sectors were included in the study to see how these tools could best benefit communities.	Both teachers and health workers were provided with camera phones, pico projectors, and a basic user interface for creating digital content to share with students and communities. The groups were then studied to assess how these technologies impacted them.	Simple user interface and limited text instructions helps users with few digital skills to create digital content. Using local languages is important for gaining buy-in and understanding. Teachers and other professionals were able to adapt their real world skills to the digital content provided. Using battery-operated, portable devices helps address the constraints of infrastructure and power. Portable devices also increase the range of ways and places they can be used. For example, one health trainer used the projector to train women who were not able to attend community meetings.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
mLearning Research Ghana, Preliminary Findings (Dawes & D'Elia, 2011a)	A field survey was conducted to better understand how youth in Ghana use their mobiles phones, how they value them, and their interest in accessing different youth employment and educational content via mobile phones.	Data collection included expert interviews, in-depth interviews, focus groups, quantitative surveys, and mobile surveys over a four-week period in 2011. 1,000 mobile data users were surveyed. The majority were male (82.5%) and 72% had a secondary education or higher.	West Africa is a different market than the rest of Africa and local initiatives need more focus. 90% of those working are employed in the informal sector. Financial literacy is a barrier to uptake of mobile money and other financial services. Youth don't understand how to attain the career they would like to have. Word of mouth is the best way to find employment. The preferred way to learn via mobile were: Internet (75%) and SMS (46%), Voice (28%), apps (27%), and social networking (22%).
Researching the links between ICT skills and Employability: An Analytical Framework. https://digital.lib.washington.edu/dspace/bitstream/handle/1773/16310/TASCHA_ICT-Employability-Framework_2009.pdf?sequence=1 (Garrido, Sullivan, Gordon, & Coward, 2009)	The authors create a multi-level framework to illustrate the role ICTs have in creating improved livelihood opportunities for disadvantaged communities.	The paper pulls findings from 70 NGOs that provided ICT training programs in 23 countries. Programs were examined on three levels: (a) how they were tailored to particular target groups; (b) the relationships among NGOs, employers, donors, governments, and other networks; and (c) the factors that influence employment dynamics.	Basic ICT skills are not a sufficient condition for disadvantaged groups to gain economic opportunities. There are other factors that must be considered and people must be able to situate ICT skills in with a number of other skills to find new livelihood opportunities. There are many barriers to entry into the job market and ICT skills are very rarely the missing link. Far more frequently, soft skills and structural barriers were more important.

Title and Source	Purpose of the Research	Methodology /Limitations	Relevant Findings and Applicability to mYWD
Mobile Technologies For Employability In Europe And Eurasia Desk Study (USAID, 2012b)	This paper explores the context in several countries in Europe and Eurasia to identify factors of success for mobile job-searching and job-seeking programs.	Research for this paper was conducted through a review of the literature, as well as through interviews with practitioners.	Mobile job-searching and job-matching programs are unlikely to be successful without more traditional programming to support them. There is no evidence of mobiles contributing to improvement in employability. Characteristics of countries with successful job-matching programs include relatively high levels of unemployment, relatively small informal economies, and strong domestic and donor support for employability programs. Women can benefit from flexible, supplemental income from tasks that can be done in short periods of time from home.
Maximizing Mobile http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/0,,contentMDK:23190786~pagePK:210058~piPK:210062~theSitePK:282823,00.html (The World Bank, 2012)	This report analyzes the growth and evolution of applications for mobile phones. It covers their use in agriculture, health, and financial services, and their impact on employment and government. It explores the consequences for development of an emerging “app economy.” It summarizes current thinking with the goal of informing the debate on the use of mobile phones for development.	The report’s different chapters consist of a variety of methods, including desk research, interviews, and literature reviews.	The developing world is more mobile than the developed world. Mobile applications not only empower individual users, they also enrich their lifestyles and livelihoods, and boost the economy as a whole. Engaging mobile applications for development requires an enabling “ecosystem.”

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
The Impact of ICT Hubs on African Entrepreneurs: A case study of iHub (Nairobi) http://www.ihub.co.ke/downloads/ihub_entrepreneurs_report.pdf (Moraa & Mwangi, 2012)	This research aimed to understand the impact of the ICT Hubs on entrepreneurs. The study found that 100% of the entrepreneurs appreciated the iHub space as a conducive and innovative co-working environment that enables collaboration and partnerships, sharing skills, and gaining knowledge through teamwork.	The report is part of a year-long study on various ICT Hubs across Africa. The iHub Research team did a three-month study to understand the iHub model, its members, and its impacts. A total of 25 members were interviewed. The sample size was not statistically representative of the entire iHub population.	100 percent of entrepreneurs surveyed who use the iHub felt it was useful. The space has served as a supportive and innovative co-working space. Many member entrepreneurs had graduated with no formal job opportunities and felt their talents and skills had been nurtured within the hub. Challenges member entrepreneurs reported in their start-up businesses included funding and access to capital, capacity for sustained growth, the right mentors, need for a better understanding of pricing models for their products, competition with larger for-profits like Google and Safaricom, and a tendency to rely on conjecture rather than market research or feasibility-viability studies. Only 16% of iHub's 7,000+ members were female.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
ICT Hubs Model: Understanding the factors that make up the Activspaces model in Buea, Cameroon http://www.research.ihub.co.ke/uploads/2012/september/1348591625_819_404.pdf (Moraa & Murage, 2012)	The study aims to better understand the model used for the ActivSpaces Technology hub in Buea, Cameroon.	Two methods were used to understand how the ActivSpaces model works: Virtual interview with ActivSpaces Manager, Albert Banda literature review on Cameroon's ICT market and ActivSpaces. Available secondary information on the ActivSpaces website was also reviewed. Data collection took two weeks, followed by one week of analysis and reporting.	A major challenge is slow Internet access and capacity. The hub has made a choice to not engage with government, citing corruption and the desire to remain neutral and independent. This presents both a funding and sustainability challenge. Other problems described included capacity to run the space, difficulty in attracting members to the hub, managing all the members, lack of seed capital, and lack of direct mentorship and counseling.
Furuholt, B., & Matotay, E. (2011). The developmental contribution from mobile phones across the agricultural value chain in rural Africa. http://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/849 (Furuholt & Matotay, 2011)	Furuholt and Matotay examine the use of mobile phones among farmers in rural Tanzania. The paper concludes that improved access to communication via mobile phones has increased opportunities and reduced risks for farmers in these communities.	Study participants were farmers in 13 villages in a rural district of Tanzania. Interviews focused on the farmers' activities regarding mobile phones and livelihoods. A document analysis was also used to support the findings of these interviews.	Mobile devices can reduce waste and empower smallholders during negotiations with markets and other stakeholders. This makes the markets more efficient. Small farmers have access to more timely information about prices and other market information through mobile devices. Devices can also be used as advance warning systems for risks to agricultural production. Mobile phone usage was seen to increase during peak seasons. Phones were used to sell crops, collect information, order supplies, and organize storage of crops.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Connected Agriculture: The role of mobile in driving efficiency and sustainability in the food and agriculture value chain http://www.vodafone.com/content/dam/vodafone/about/sustainability/2011/pdf/connected_agriculture.pdf (Accenture & Vodafone Group Plc, 2011)	Vodafone commissioned Accenture in 2011 to research the potential for mobile technology to improve agricultural efficiency and productivity, increase the income of small-scale farmers, and minimize the environmental impact of increasing food production. The report outlines the opportunities, barriers, and benefits of mobile in agriculture and offers recommendations for action by businesses, governments, and NGOs.	The report is based on desk research and stakeholder consultation. Four workshops—in India, South Africa, Tanzania, and the UK—provided insights from over 50 external stakeholders from the private, public, and not-for-profit sectors from every part of the value chain. In-depth interviews were conducted with four external stakeholders. The process identified key challenges in the value chain and a list of some 100 potential opportunities. These were prioritized based on qualitative assessments to a shortlist of 12. Each of the 12 opportunities was modeled across 26 countries in Africa, India, Australasia, Europe, and the Middle East.	Mobile communications can help to meet the challenge of feeding an estimated 9.2 billion people by 2050. There are four major areas of opportunity in mobile and agriculture. These could increase agricultural income by an estimated US$138 billion in 26 of Vodafone's markets by 2020. The four areas are: • Increasing access and affordability of financial services tailored for agricultural purposes through mobile payment, micro-insurance and micro-lending platforms • Mobile information platforms and farmer helplines to deliver information relevant to farmers, such as agricultural techniques, commodity prices and weather forecasts, where traditional methods of communication are limited • Optimizing supply chain management across the sector and delivering efficiency improvements for transportation logistics using smart logistics, traceability and tracking systems, mobile management of supplier networks, and mobile management of distribution networks • Enhancing the link between commodity exchanges, traders, buyers and sellers of agricultural produce through agricultural trading, tendering, and bartering platforms. • The report concludes that mobile network operators are key catalysts for action due to their technology, distribution channels and customer relationships. • NGOs, private enterprises, and governments must agree to contribute their knowledge and expertise in order to ensure the delivery of the benefits to their full potential.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Agricultural Extension in Kenya, Practice and Policy Lessons http://ageconsearch.umn.edu/bitstream/55168/2/wp26.pdf (Muyanga & Jayne, 2006)	The objective of this study is to assess the range of alternative food crop and livestock extension services currently operating in Kenya. The report is primarily descriptive, providing knowledge on the nature of the existing extension providers, their characteristics, approaches employed, and the challenges they face.	The study covered 16 districts representing the various agro-regional zones present in Kenya. It employed qualitative methods and focused on private and public extension service providers. Discussions were also held with other stakeholders in the agricultural extension service realm about their experiences and perceptions of the existing extension systems and approaches.	The study highlights five important findings: • Private extension provision is generally skewed towards high agricultural potential regions and high-value crops. Remote areas and poor producers, especially those growing low-value crops with little marketable surplus, are poorly served. Non-profit private providers are targeting them, but their reach is limited. • Public resources for extension are very constrained; it may make sense for public extension not to duplicate or overlap in the same areas that are being served more efficiently by commercial and non-profit systems. • Commercial and non-profit extension systems benefit from the presence of the public extension services. • The government should consider contracting the private sector to offer extension services in the disadvantaged regions. Contracting out extension services makes it possible to take advantage of all of the talent and experience existing in the field but does not eliminate a government role which, in addition to funding, ensures quality assurance, oversight, and provision of training and information to contracted services providers. • Private extension is not a substitute for public extension and the public sector should fund extension significantly but in ways that do not duplicate services already being provided by sustainable alternative extension providers.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
The Value of Advice: Evidence from Mobile Phone-Based Agricultural Extension http://www.hbs.edu/faculty/Publication%20Files/13-047_08f3cd3a-dfb4-482e-af80-f53b20f1ad46.pdf (Cole & Fernando, 2012)	This study is a randomized evaluation of the introduction of a mobile-phone based agricultural consulting service, “Avaaj Otalo” (AO), to cotton farmers in Gujarat, India. This paper explores the possibility of improving agricultural management and reducing barriers to technology adoption resulting from “informational inefficiencies” by delivering customized, timely advice via mobile phone. It evaluates Avaaj Otalo (AO), a mobile phone-based technology that allows farmers to call a hotline, ask questions, and receive responses from agricultural scientists and local extension workers.	The research team randomly assigned toll-free access to AO to 800 households, with an additional 400 households serving as a control group. Treatment respondents also received weekly push-content, which includes time sensitive information, such as weather forecasts and pest planning strategies. Prior to delivering the intervention, all households participated in a baseline household survey. Treatment respondents were then trained on how to use AO. Follow-up surveys were conducted by mobile phone.	Demand for agricultural advice was high, with more than half of farmers calling AO in the first seven months. Farmers offered the service turned less often to other farmers and input sellers for agricultural advice. Management practices changed as a result of the intervention. Treated farmers sowed a significantly larger quantity of cumin, a lucrative but risky crop. Farmers appear willing to follow advice without understanding why the advice is correct.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Mobile phones and rural livelihoods: Diffusion, uses, and perceived impacts among farmers in rural Uganda. http://www.mobileactive.org/files/file_uploads/789-2211-1-PB_2.pdf (Martin & Hall, 2011)	In order to develop successful mobile phone programming in the future, this study attempts to understand the impact of social structures on mobile phone usage. This study was able to identify several unique strategies adopted by agricultural communities, as well as some lessons for future programming.	Interviews were conducted with 90 mobile phone users who owned small- to medium-sized farms. Questions focused on the use of mobile technology to access agricultural information and markets.	Mobile phones are being adopted for agricultural purposes such as accessing markets, agricultural advice, and consolidation and coordination. While women tended to be later adopters of mobile phones, women with more status were more likely to have access to and use mobile phones. Stakeholder needs must be incorporated into development and training on these initiatives. There is potential for using mobile phones to connect smaller farmers in ways that help them to collectively enter larger, more profitable markets.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Women Entrepreneurs in Mobile Retail Channels: Empowering Women, Driving Growth. http://www.cherieblairfoundation.org/wp-content/uploads/2012/07/Women-Entrepreneurs-in-Mobile-Retail-Channels.pdf (TNS et al., 2012)	The Mobile Value Chain markets in eleven countries around the world were investigated to determine the current level of women's participation and the potential benefit they might derive from further involvement in these markets.	Desk research was supplemented with interviews and surveys of women entrepreneurs, MNOs, and other stakeholders in these 11 markets. Existing literature was incorporated to support the findings.	Mobile operator-led initiatives are beneficial to both their target communities and MNOs. Operators can do more to integrate women into these programs. Women still struggle to participate in the higher levels of the value chain. They manage microbusinesses, but do not have the capital or support to expand further. Additional flexibility in mobile-related products allows women to work from home more frequently and tend to other responsibilities such as childcare. It also allows them to improve their standing in the community, gaining respect and influence over other aspects of community development. Margins in this business are low, which is why many women considered this to be supplementary income instead of a primary income stream.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Women & Mobiles: A global opportunity http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/GSMA_Women_and_Mobile-A_Global_Opportunity.pdf (Cherie Blair Foundation for Women & GSMA Development Fund, 2010)	The research looks at women's mobile phone ownership in four low- and middle-income countries, finding that a gap exists between men's and women's ownership of mobile devices. This offers a large revenue opportunity for mobile network operators and could help women feel safer, access more services, and do business via mobile.	The methodology included: primary and secondary research, third-party databases, 40 expert interviews, and over 2,000 in-person consumer surveys of women between 14 and 74 years of age in Bolivia, Kenya, Egypt, and India.	Women are 21% less likely to own a phone than men (23% in Africa, 24% in the Middle East and 37% in South Asia). A number of barriers exist for women to own handsets including: cost (42%), no need (30%), too expensive (8%), no permission (3%), fear of technology (3%), and combined reasons (13%)
Job Creation through Building the Field of Impact Sourcing https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0CEwQFjAD&url=http%3A%2F%2Fwww.rockefellerfoundation.org%2Fmedia%2Fdownload%2Fc2cbb5d3-500c-4ced-8387-a7469b567b98&ei=FZ9dUfP1J-qe2QWU3oEI&usg=AFQjCNGqUZPu2v9LK7DT6F5QWJPSPVcYjw&sig2=5R4VWXzSCmcvwK2Tx8Y_Sw&bvm=bv.44770516,d.b2I (Monitor Group, 2011)	The paper aims to build a shared understanding of current impact sourcing (IS) activity, parameters, size and potential impact and to assess activities that could be undertaken to help this field grow. The paper highlights key delivery and social models, the main obstacles to growth, and the interventions required to drive this endeavor forward.	The Monitor Group conducted more than 120 interviews across 13 countries with Impact Sourcing managers, business process outsourcing (BPO) providers, outsourcing experts, employees, outsourcing clients, government officials and other individuals linked to the IS space. Monitor also interviewed 25 industry experts, BPO providers, and other industry participants at a meeting on impact sourcing in Nairobi in December 2010.	Key Findings: Data suggests that Impact Sourcing employees' incomes increased between 40% and 200%. In addition to the benefits of formal, stable employment, Impact Sourcing employment increases family investment in health care and education. Three key actions can catalyze IS over the coming two to three years: • Training, recruiting and engaging BPO workers • Creating a shared platform for the IS field • Creating means of connecting small Impact Sourcing Service Providers with established BPOs • Nine key barriers to growth exist: • Demand constraints such as accessing clients and contracts, creating anchor demand • Positioning and branding constraints to growing IS in countries with limited or emerging BPO industries and issues with client attitude towards Impact Sourcing, and navigating the political implications of offshoring • Supply constraints to recruiting, employing, and training the "real" base of the pyramid • Avoiding the race to the bottom of low-value data outsourcing services • Accessing infrastructure in rural and low-employment areas • Identifying investors

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Exploring the Value Proposition of Impact Sourcing: The Buyer's Perspective https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&sqi=2&ved=0CEIQFjAC&url=http%3A%2F%2Fwww.rockefellerfoundation.org%2Fmedia%2Fdownload%2F0e8a528e-9df6-4ce4-9b40-13cf7fb27963&ei=pZ9dUcrqC4eQ2QW5yoCwDQ&usg=AFQjCNGCGpJpHx7KHZwS5ETtwGFcOTZzug&sig2=bhxC1jLUXxUzo-a094aG0qQ&bvm=bv.44770516,d.b2I (Bulloch & Long, 2012)	This feasibility study, undertaken by Accenture Development Partnerships with the support of the Rockefeller Foundation, examines the value proposition of Impact Sourcing from the buyer's perspective and attempts to determine whether Impact Sourcing can be a viable business model. This study aims to provide evidence that big businesses, such as large outsourcing companies like Accenture, as well as smaller ISSP players, have an integral role within Impact Sourcing and can realize significant benefits from such initiatives.	To test the proposed hypothesis, Accenture Development Partnerships undertook a large-scale survey of over 320 Accenture executives engaged in work at leading global companies to understand their perception of Impact Sourcing and their company's willingness to pursue such initiatives.	Impact Sourcing is a viable business model as long as two conditions are met: (a) there is sufficient demand for the services and the client (buyer of the services) is able to meet its outsourcing objectives, and (b) the model offers a competitive and sustainable solution. Of companies surveyed, 48% were interested in Impact Sourcing. There is IS demand as long as the traditional outsourcing buyer values—lower cost and high quality—can be met. Cost and quality continue to be the top priorities for companies. Clients are most interested in Impact Sourcing in the areas of Business Process Outsourcing and Application Outsourcing. Client teams are open to considering Impact Sourcing for up to 25% of their outsourcing portfolio. Countries that are considered the largest hosts of potential clients can also be Impact Sourcing destinations

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Scaling Up: A Framework and Lessons for Development Effectiveness from Literature and Practice (Hartmann & Linn, 2008)	The research sets out a framework and advice on ways that scaling up should be approached systematically.	The paper takes a comprehensive look at what the literature and practice say about when and how to scale up development interventions. While a large number of sources and cases are reviewed, the authors note that coverage of literature is not exhaustive. The review does not delve into the issue of aid effectiveness but rather looks at interventions more generally.	The authors found that: • There is little evidence on the failure of efforts to scale. • There are few thorough, scientifically rigorous impact evaluations of large-scale interventions and none that permit a rigorous identification of the multiple factors that determine success or failure of scaled-up programs. • There were no evaluations of institutional performance regarding scaling up. The authors note that scaling up needs: • Leadership, vision, and values • Political constituencies • Mutually supportive policies, programs, and projects • Institutions willing and able to support change • Incentives and accountability • Effective monitoring and evaluation • An orderly and gradual process if it is to be effective They recommend that donors realign their rhetoric and strategies to be more supportive of scaling up and doing it well

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Scaling Mobile for Development: A developing world opportunity (GSMA Mobile and Development Intelligence, 2013)	The research examines the market landscape; the impact of mobile on development sectors; platforms, multiplicity, scalability and re-use; and user-centric innovation	n/a	M4D is growing: There are over 800 live mobile-enabled products and services in the developing world. There are interesting geographic distributions: mobile money in Africa, learning and education in Asia, health and agriculture are more evenly distributed. Emergence of new business models: New sectors and business models are emerging. Donor funding remains the most common model in mHealth, but others drawing revenue from consumers or business are used in the financial, learning, and entrepreneurship sectors. Barriers to scale are multifaceted: Scale is driven by a number of factors related both to an organization and the wider sector. Across the M4D sector, the most important are the presence of defined value chains, sustainable business models, and market visibility. An important distinction: It is important to distinguish between a true platform, a framework, and a bespoke service. Platforms (e.g. Linux, iOS, Android) are generic and can accommodate a range of applications or services. Frameworks (e.g. Fundamo, Frontline SMS) are less generic than platforms, but provide many re-usable tools for others to use in M4D services. Bespoke M4D services are the least generic and are generally designed for one sector in one country. In the M4D sector, bespoke services are most common, followed by frameworks, with true platforms generally controlled by global TMT firms, with or without direct interests in M4D. Mobile money stands out: The mobile money sector has the most defined value chain, including a layer for vendors (e.g. Fundamo, Comviva) providing the underlying frameworks on which the services are built.

Title and Source	Purpose of the Research	Methodology / Limitations	Relevant Findings and Applicability to mYWD
Research: Leveraging Information and Communication Technology for the Base of the Pyramid. Innovative business models in education, health, agriculture, and financial services. (Hystra, 2011)	The report looks at four sectors of ICT4D (education, health, finance, and agriculture). The report aims to better understand common barriers to scale and financial sustainability of ICT4D projects based on their business models.	The authors screened 280 projects, over half of which are still young or not financially sustainable, and selected 16 for in-depth analysis of business models. Field visits, interviews, and experience sharing at workshops were also part of the research.	A market-based approach should: • Focus on a problem-driven approach for sustainable projects to emerge out of myriad existing trials. • Support existing entrepreneurs, promote synergies, and remove barriers to scale • Create a systemic environment for cross-border replication

ANNEX 4: Key Informant Interviews

Name	Organization
Leo Burd	Research Scientist, MIT Center for Mobile Learning
Corina Gardner	Senior Manager, GSMA Mobile Development Intelligence Program
Dorothy Okello	Founder of Women of Uganda Network (WOUGNET)
Dan Sutera	Founder, Impact Network / Impact Enterprises
James Bon Tempo	Director of ICT and Innovation, Johns Hopkins Center for Communication Programs
John Traxler	Founding Director of the International Association for Mobile Learning
Lauren Kotze	Program Manager, Praekelt Foundation
Colin Abouchabki	Chief Operating Officer, Praekelt Foundation
Pippa Yeats	Researcher, Praekelt Foundation
Mika Valitalo	ICT4D and Corporate Partnerships Manager, Plan Finland
Tuulia Virhia	ICT4D and Corporate Programs Manager, Plan Finland
Samuel Suraphel	Manager, Technology Partnerships, International Youth Foundation
Lee Babcock	Managing Director, Mobile Strategy, ACDI-VOCA
Stephane Boyera	Lead Program Manager, World Wide Web Foundation
Steve Vosloo	Program Specialist, UNESCO; Founder of Yoza Cellphone Stories
Rumbi Goredema	Portfolio Manager, Connection to Opportunity, DG Murray Trust
David Harrison	CEO, DG Murray Trust
Rachel Blum	Technical Project Specialist, Youth and Workforce Development, USAID
Sarah Troupe	Associate, Digital Jobs Africa, Rockefeller Foundation
Wayan Vota	Communications Manager, Development Gateway and Educational Technology Debate
Jacob Korenblum	President and CEO, Souktel
Louise Guido	CEO, ChangeCorps
James Bernard	Director, Microsoft Partners in Learning
Maria Langworthy	International Project Director, Innovative Teaching and Learning Research, Microsoft Partners in Learning
Marieme Jamme	CEO SpotOne Global Solutions, Founder of JJiguene Tech Senegal and Africa Gathering
Matthew Kam	Senior Technology Strategist for Education, American Institutes for Research
Elizabeth Markovic	Senior Program Officer, Winrock
Paul Goodman	CEO, Acopio
Josh Woodard	Project Manager, TechLab, FHI 360

ANNEX 5: Employment Constraints, Youth Workforce Development Programming and the Role of Mobile Technology

1) Mobiles for youth workforce education and training			
Employment Constraints (From The World Bank, 2010)	mYWD programming to address constraints		
Job-relevant skills constraints	Workforce Education and Training (adapted from World Bank, 2010; USAID, 2013)	Potential for mobile to help overcome constraints	Examples of mobiles for youth workforce education and training
Insufficient basic skills (literacy and numeracy)	Basic education, literacy, educational reinforcement, second chance programs, programs promoting the value of education	Allowing youth to directly receive, access, produce and interact with relevant educational content, technical training content and entrepreneurial training content Helping youth discover and link with education and training programs Enabling teachers, trainers and staff to improve their approach to teaching and learning, improving content and measuring results Enabling learners, teachers, and staff to measure and track results of their efforts.	Basic Education, Literacy and Numeracy: PAJE-Niéta, BridgeIT, Jokko Initiative Project ABC, Girls Literacy, Fundza, Yoza, Nokia Life Tools Language Learning: BBC Janala, Najja7ni
Technical skills mismatch (trade or job-specific skills)	Technical training and “training plus” programs, on-the-job training		Hard Skills: SHOPS, AMREF
Behavioral skills mismatch (non-cognitive skills)	Soft skills training		Soft Skills: eLife, Young Africa Live, Ummeli
Insufficient entrepreneurial skills (inventing/ adapting new products, processes, and business skills to market ideas)	Entrepreneurial training		Entrepreneurship Training: Shaqodoon Build your Business, MobiWorks, g.Maarifa, Akazi Kanoza, Farmbook

2) Demand-side policies and programs			
Employment Constraints (From The World Bank, 2010)	mYWD programming to address constraints		
Lack of labor demand	Demand-side policies and programs (adapted from World Bank, 2010; USAID, 2013)	Potential for mobile to help overcome constraints	Examples of mYWD demand-side programs
Slow job-growth economy (labor exceeds demand)	Creation of opportunities, wage or training subsidies, public service programs, public works programs	Creating jobs within the mobile industry and along the mobile value chain Creating information-related jobs Enabling cash transfers for wage and training subsidies	Job creation: Poverty Reduction through Information and Digital Employment (PRIDE) Information related jobs: Grameen Community Knowledge Workers, Movercado Subsidies: Waseela-e-Rozgar
Employer discrimination (bias against hiring youth)	Affirmative action, employee mentoring, creation of micro-level work opportunities	Encouraging more inclusive sourcing of workers in mobile industries Creating micro-work opportunities	Anti-discrimination: Impact Sourcing Microwork: Digital Divide Data, Jana, Samasource

3) Mobiles for Employment Services			
Employment Constraints (From World Bank, 2010)	mYWD programming to address constraints		
Job search constraints	Employment services (adapted from The World Bank, 2010; USAID, 2013)	Potential for mobile to help overcome constraints	Examples of mobiles and employment services programs
Job seeking/matching	Job seeking, job matching, opportunity linking, career counseling	Connecting youth to job opportunities Connecting youth to career counseling through mobile social networks	Job seek/job match: Souktel, Njorku, Babajobs, mPawa, DUMA, Akazi Kanoze Career services: Ummeli, Career Planet
Signaling competencies (communicating skills to potential employers)	Skills certification and accreditation	Assigning and signaling certification for mobile CVs	Certification: Mozilla Open Badges

4) Mobiles for Entrepreneurship and Enterprise Development			
Employment Constraints (From The World Bank, 2010)	mYWD programming to address constraints		
Firm start-up constraints	Entrepreneurship and Enterprise Development (adapted from The World Bank, 2010; USAID, 2013)	Potential for mobile to help overcome constraints	Examples of mobiles for entrepreneurship and enterprise development programs
Lack of access to financial or social capital	Comprehensive entrepreneurship support, including training, mentoring, networking, business skills development, financial services for loans and capital.	Catalyzing opportunities for youth entrepreneurship in the technology sector via training, incubation, connection, community and funding Enabling access to and organization of timely and relevant information that supports the development and management of farms and small enterprises Connecting youth to money-making opportunities, local and global markets	Mobile app development: Apps4 Africa, Innovation Hubs and Labs Small enterprise information and management: Farm Radio, The Organic Farmer, Lifelines Agriculture, CocoaLink, Jigyolia 7676, Digital Green, Farmbook, iCow, Acopio, Tiendatek DrumNet, mFarms, IMAC, Esoko Connecting to markets: CellBazaar, Quickr, Tradenet, Mzantsi Prepaid, iPay

5) Mobiles and social norms programming			
Employment Constraints (From The World Bank, 2010)	mYWD programming to address constraints		
Social constraints	Addressing social norms (adapted from The World Bank, 2010; USAID, 2013)]	Potential for mobile to help overcome constraints	Examples of mobiles and social norms programming
Excluded-group constraints (disability, ethnicity, gender, etc.)	Supporting the effective participation of excluded groups in youth workforce development programs Providing non-traditional skills training Ensuring safe training and employment spaces for excluded groups Adjusting program content and design to account for specific needs of excluded groups	Enabling alternative and/or non-traditional mentoring, training and work opportunities to excluded groups Enabling youth with disabilities to access work opportunities	Mentoring, training and work opportunities: Girls who Code, Akira Chix, Jjiguene Tech Hub, Digital Divide Data, Samasource, Souktel Enabling work opportunities: Computer Aid, Dolphin, SightSavers
	Behavior change campaigns	Behavior change campaigns aimed at changing societal and individual attitudes about the involvement of excluded groups in the labor market	Behavior Change Campaigns: mWomen, Girls in ICTs Day, Tech Needs Girls, Women in Mobile, Women in Tech in Nigeria, ITU

ANNEX 6: Additional Resources

Africa Progress Panel. (2012). *A twin education crisis is holding back Africa. Progress report 2012*. Retrieved from http://allafrica.com/download/resource/main/main/idatcs/00041767:3beade781efc2ff08cd759812ac1c092.pdf

Aitchison, J. (2012). *Youth and adult learning and education in southern Africa*. Retrieved from http://www.osisa.org/sites/default/files/educationoverview02.pdf

Aker, J. C., & Mbiti, I. M. (2010). Mobile phones and economic development in Africa. *Journal of Economic Perspectives*, *24*(3), 207–232. doi:10.1257/jep.24.3.207

Ally, M. (Ed.). (2009). *Mobile learning: Transforming the delivery of education and training*. Edmonton: AU Press. Retrieved from http://www.aupress.ca/books/120155/ebook/99Z_Mohamed_Ally_2009-MobileLearning.pdf

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *The International Review of Research in Open and Distance Learning*, *12*(3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/890/1663

Andrianaivo, M., & Kpodar, K. (2011). *ICT, financial inclusion, and growth: evidence from African countries* [Working paper]. Washington, DC: IMF. Retrieved from http://www.imf.org/external/pubs/ft/wp/2011/wp1173.pdf

Aring, M. (2011). *Technical and vocational education and training*. Washington, DC: USAID EQUIP 3. Retrieved from www.equip123.net/docs/e3-TVET.pdf

Asian Development Bank. (2009). *Good practice in information and communication technology for education*. Manila, Philippines: Author. Retrieved from http://www.adb.org/sites/default/files/pub/2009/Good-Practice-in-ICT-for-Education.pdf

BBC Media Action. (2012, March). *Still left in the dark. Policy briefing*. Retrieved from http://downloads.bbc.co.uk/mediaaction/policybriefing/bbc_media_action_still_left_in_the_dark_policy_briefing.pdf

Beauclerk, J., & McLaughlin, D. (2012). *Plan international youth economic empowerment. Synthesis report of piloting experience 2010–2011.* Oxford, UK: INTRAC. Retrieved from www.suyadi.com/yeeplan/Synthesis%20report_FINAL_2012-05-21.pdf

Bhavnani, A, Chiu, R.W., Janakarim, S., & Silarszky, P. (2008). The role of mobile phones in sustainable rural poverty reduction. Retrieved from *http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/The_Role_of_Mobile_Phones_in_Sustainable_Rural_Poverty_Reduction_June_2008.pdf*

Boakye, K., Scott, N., & Smyth, C. (2010). *Mobiles for development*. New York, NY: UNICEF. Retrieved from http://www.gamos.org/images/documents/UNICEF%20Mobiles4Dev%20Report%20for%20Dessemination.pdf

Bound, K., & Thornton, I. (2012). *Our frugal future: Lessons from India's innovation system*. Retrieved from *www.nesta.org.uk/library/documents/OurFrugFuture.pdf*

Briones, R. M. (2011). *Workforce development initiatives for out-of-school youth – What works ? A participatory research with youth and communities.* Washington, DC: USAID. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/e3-WFDReport.pdf

Buskens, I., & Webb, A. (2009). *African women and ICTs: Investigating technology, gender and empowerment*. New York, NY: Zed Books. Retrieved from http://idl-bnc.idrc.ca/dspace/bitstream/10625/37700/1/127929.pdf

Butcher, N. (2003). *Technological Infrastructure and use of ICT in education in Africa: An overview*. Retrieved from *www.adeanet.org/pubadea/publications/pdf/dol_ICT_eng.pdf*

Castel, V., & Mejia, P. X. (2012). *The African Development Bank Group in North Africa. 2012: A year of transitions*. Tunis-Belvedere, Tunisia: African Development Bank (AfDB) Group. Retrieved from http://www.afdb.org/

fileadmin/uploads/afdb/Documents/Publications/Rapport Anglais 2012.pdf

la Cava, G., Rossotto, C. M., & Paradi-Guilford, C. (2011, February). *Youth in MENA: Policies to promote employment.* Washington, DC: World Bank. Retrieved from *siteresources.worldbank.org/INTKNOLEA/Resources/AWB-1.pdf*

ChangeCorp. (2013). eLife tablet for teachers. Retrieved from http://change-corp.com/apps/elife-tablet-for-teachers/

Chapple, K. (2005). *Building institutions from the region up: Regional workforce development collaboratives in California.* Berkeley, CA: Institute of Urban and Regional Development. Retrieved from http://www.iurd.berkeley.edu/publications/wp/2005-01.pdf

Chew, H.E. (2011). The limited impact of ICTs on microenterprise growth: A study of businesses owned by women in urban India. *Information Technologies & International Development, 7*(4). Retrieved from https://idl-bnc.idrc.ca/dspace/bitstream/1*0625/50700/1/IDL-50700.pdf*

Chew, H.E., Ilavarasan, P.V., Levy, M. R. (2010). The economic impact of information and communication technologies (ICTs) on microenterprises in the context of development. *Electronic Journal of Information Systems in Developing Countries, 44*(4): 1-19. Retrieved from http://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/747/340

Chigona, W., Vally, J., & Tanner, M. (2009). Can mobile Internet help alleviate social exclusion in developing countries? *The Electronic Journal of Information Systems in Developing Countries, 36*.Retrieved from http://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/535/270

Cisco. (2013). *Cisco Visual Networking Index: Global mobile data traffic forecast update, 2012 – 2017*. Retrieved from http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.pdf

Coenjaerts, C., Ernst, C., Fortuny, M., & Rei, D. (2009). Youth employment. In OECD (Ed.), *Promoting pro-poor growth employment* (pp. 119-131)*.* Paris, France: OECD. Retrieved from www.oecd.org/dataoecd/27/4/43280339.pdf

Coward, C., & Sey, A. (2013). *Public access to ICTs: Sculpting the profile of users* [Working paper]. Seattle, WA: Technology & Social Change Group. Retrieved from http://www.globalimpactstudy.org/wp-content/uploads/2012/01/Global-Impact-Study-User-Profiles-Survey-Working-Paper-1.pdf

Curtain, R. (2002, June 15). *Generating youth employment through information and communication technologies: Best practice examples and strategies*. Paper presented at the Youth Employment Summit (YES2002), Melbourne, Australia. Retrieved from www.yesweb.org/gkr/res/bg.ict.ta.rtf

CyberSmart Africa. (n.d.). *CyberSmart Africa* [Flyer]. Retrieved from http://www.cybersmartafrica.org/wp-content/uploads/2011/09/CyberSmartFlyer.pdf

Dalberg Global Development Advisors. (2012, May). *Preparing the next generation of community health workers: The power of technology for training.* Retrieved from www.dalberg.com/documents/Power_of_Technology.pdf

Dubai School of Government. (2012). *Social media, employment and entrepreneurship. New frontiers for the economic empowerment of Arab youth?* Dubai, UAE: Author. Retrieved from http://www.dsg.ae/en/Publication/Pdf_En/103201211214516440000.pdf

Dutta, S., & Mia, I. (2011). *The global information technology report 2010–2011*. Geneva, Switzerland: World Economic Forum. Retrieved from www3.weforum.org/docs/WEF_GITR_Report_2011.pdf

Easter, S., & Ewins, R. (2010, May). *Funding for e-learning in Africa: A question of sustainability* [Draft]. Retrieved from speedysnail.com/2010/Easter_and_Ewins_2010.pdf

Education Development Center. (2011). *The Somali Interactive Radio Instruction Program*. Washington, DC: Author. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/EDC Education in Fragility Series-Somalia SIRIP.pdf

Education Development Center. (2012). *Addressing corruption in education. A toolkit for youth from youth*. Washington, DC: Author. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/Transparency%20in%20Education_Tool%20Kit_EDC%20reduced.pdf

Education Development Center. (2012b). *Mali support to youth entrepreneurs project, PAJE-Nièta.* Washington, DC: Author. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/PAJE-Nièta Mali Support to Youth Entrepreneurs Project.pdf

Education Development Center. (2012a). *Technology teaching and learning.* Beirut, Lebanon: Author. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/Technology Teaching and Learning - Research, Experience, & Global Lessons Learned.pdf

Fafchamps, M., & Minten, B. (2012). Impact of SMS-based agricultural information on Indian farmers. *The World Bank Economic Review*, *26*(3), 383–414. doi:10.1093/wber/lhr056

Farnsworth Riche, M. (2003, September). *Equal opportunity and youth employment. A Background Report for the Equal.* Washington, DC: International Center for Research on Women. Retrieved from http://www.icrw.org/files/publications/Equal-Opportunity-and-Youth-Employment.pdf

Fawcett, C., & McPherson, M. (2005). *The context for workforce development programs and policies.* Retrieved from http://www.google.com/url?q=http://www.glp.net/c/document_library/get_file%3FfolderId%3D225315%26name%3DDLFE-7810.pdf&sa=U&ei=t7q6UfLrHYzj4AORwIC4Dw&ved=0CCAQFjAC&sig2=hUjxbdLHtOZ-ImKf5igzfw&usg=AFQjCNFeEtj0iZYkArnl645za2j7OJ5fXQ

Fawcett, C., & Raz, R. (2010). *At-risk youth in Latin America & the Caribbean*. Retrieved from http://siteresources.worldbank.org/INTLACREGTOPLABSOCPRO/Resources/YouthatriskinLAC.pdf

Figueredo, V., & Anzalone, S. (2003, January). *Alternative models for secondary education in developing countries: Rationale and realities.* Washington, DC: Am*erican Institutes for Research.* Retrieved from http://pdf.usaid.gov/pdf_docs/PNACS510.pdf

Food and Agriculture Organization (FAO), International Fund for Agricultural Development (IFAD), & International Labor Organization (ILO). (2010). *Agricultural value chain development: Threat or opportunity for women's employment?* [Brochure]. Retrieved from http://www.ilo.org/wcmsp5/groups/public/---ed_emp/documents/publication/wcms_150833.pdf

Foundation for Social Change. (2012). *Foundation for Social Change* [Brochure]. New York, NY: Author. Retrieved from http://foundationchange.org/wp-content/uploads/2012/10/FSC-Brochure-21.pdf

Galdo, J. C., & Sanz, T. (2009). *ICTs, Job-search and informality: A randomized social experiment for disadvantaged youth in Peru* [Proposal]. Lima, Peru: Seguimiento, Análisis y Evaluación Para el Desarrollo. Retrieved from www.iadb.org/res/laresnetwork/files/pr371proposal.pdf

Garrido, M., Badshah, A., & Coward, C. (2009). Deconstructing ICT skills and employability. *Information Technologies and International Development*, *5*(2), 0–4. Retrieved from itidjournal.org/itid/article/viewFile/356/157

Garrido, M., Sullivan, J., & Gordon, A. (2012). Understanding the links between ICT skills training and employability: An analytical framework. *Information Technology & International Development, 8*(2), 17–32. Retrieved from *itidjournal.org/itid/article/view/895*

Gaudry-Perkins, F., Dawes, L. (2012). *A powerful tool for addressing MDGs.* Paris, France: Alcatel-Lucent. Retrieved from *http://www3.alcatel-lucent.com/sustainability/pdf/mLearning-A-Powerful-tool-for-addressing-MDGs-April-2012.pdf*

Gereffi, G., Fernandez-Stark, K., & Psilos, P. (2011). *Skills for upgrading: Workforce development and global value chains in developing countries*. Retrieved from http://www.cggc.duke.edu/pdfs/Skills-for-Upgrading-Workforce-Development-and-GVC-in-Developing-Countries_FullBook.pdf

Gill, B. K., Glinski, A. M., & Gaynair, G. (2012). *The Intel® Learn Program through a gender lens*. Retrieved from http://www.icrw.org/files/publications/ICRW Intel Learn Report_WEB.pdf

Gillwald, A. (2013, March 7). *Towards an understanding of ICT access and use in Africa* [Presentation]. Retrieved from http://www.researchictafrica.net/publications/Presentations/2013 Gillwald - Towards an understanding of ICT access and use in Africa.pdf

Gillwald, A., Milek, A., & Stork, C. (2010). *Gender assessment of ICT access and usage in Africa.* Retrieved from http://lirneasia.net/wp-content/uploads/2010/09/Gender_Paper_Sept_2010.pdf

Global Partnership for Education. (2012, November). *Fostering evidence-based dialogue to monitor access and quality in education*. Retrieved from http://resourcecentre.savethechildren*.se/sites/default/files/documents/7123.pdf*

Gnanamalar, E., & Daniel, S. (2005). Science teachers please SMS for soft skills: The Changing interface for learning in Malaysian science teacher education. In *Proceedings of the COSMED conference.* Penang, Malaysia: RECSAM. Retrieved from http://www.google.com/url?q=http://www.recsam.edu.my/COSMED/cosmed07/AbstractsFullPapers2007/SCIENCE%255CS007A.pdf&sa=U&ei=esC6UaysHJP94AOcvoH4Dg&ved=0CBsQFjAB&sig2=R4DSQCrRw7r_M0VlIoe2pg&usg=AFQjCNHhQQicLmCWPb1A-ehcMpXQPFhvmQ

Google. (2011). *Careerjet increases traffic and improves usability through a new mobile website.* Retrieved from http://www.howtogomo.com/images/_cms/en_gb/Careerjet_webfinal.pdf

GSMA. (2011a). *African mobile observatory 2011: Driving economic and social development through mobile services*. Retrieved from http://www.gsma.com/publicpolicy/wp-content/uploads/2012/04/africamobileobservatory2011-1.pdf

GSMA. (2011b). *The mobile proposition for education*. London., UK: Author. Retrieved from http://www.gsma.com/connectedliving/wp-content/uploads/2012/03/mobilepropositionforeducation1.pdf

GSMA. (2012). *Safeguarding, security and privacy in mobile education.* Retrieved from http://www.gsma.com/connectedliving/wp-content/uploads/2012/04/gsmasafeguardingsecurityandprivacyinmobileeducationwhitepaper.pdf

GSMA mWomen, VISA, & Bankable Frontier Associates. (2013). *Unlocking the potential: women and mobile financial services in emerging markets*. Retrieved from http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/02/GSMA-mWomen-Visa_Unlocking-the-Potential_Feb-2013.pdf

GSMA, & NTT Docomo. (2012). *Children' s use of mobile phones: An international comparison*. Retrieved from http://www.gsma.com/publicpolicy/wp-content/uploads/2012/03/GSMA_ChildrensMobilePhones2012WEB.pdf?utm_source=Mobile+Learning+Week+2013_v3_CfP&utm_campaign=8885b82361-UNESCO_Mobile_Learning3_28_2013&utm_medium=email

Gutierrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., Schor, J., Sefton-Green, J., et al. (2012). *Connected learning*. Irvine, CA: Digital Media and Learning Research Hub. Retrieved from http://dmlhub.net/sites/default/files/ConnectedLearning_report.pdf

Hafkin, N., & Taggart, N. (2001). *Gender, information technology, and developing countries: An analytic study*. Retrieved from http://ict.aed.org/infocenter/pdfs/Gender_Book_Photos.pdf

Hamel, J. (2010). *ICT4D and the human development and capabilities approach: The potentials of information and communication technology*. New York, NY: UNDP. Retrieved from *hdr.undp.org/en/reports/global/hdr2010/papers/HDRP_2010_37.pdf*

Hattingh, D., & Sun-basorun, A. (2012, October). *The rise of the African consumer.* Johannesburg, South Africa: McKinsey&Company. Retrieved from http://www.mckinsey.com/~/media/McKinsey%20Offices/South%20Africa/PDFs/Rise_of_the_African_consumer-McKinsey_Africa_Consumer_Insights_Center_report.ashx

Heeks, R. (2009). *The ICT4D 2.0 manifesto: Where next for ICTs and international development?* Retrieved from http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/documents/di_wp42.pdf

Hilbert, M. (2011). Digital gender divide or technologically empowered women in developing countries? A typical case of lies, damned lies, and statistics. *Women's Studies International Forum*, *34*(6), 479–489. doi:10.1016/j.wsif.2011.07.001

Hill, R.V., Vigneri, M., Working, E.S.A., & No, P. (2011). *Mainstreaming gender sensitivity in cash crop market supply chains.* Retrieved from www.fao.org/docrep/013/am313e/am313e00.*pdf*

Hoppers, W. (2006). *Non-formal education and basic education reform: a conceptual review*. Paris, France: International Institute for Educational Planning. Retrieved from unesdoc.unesco.org/images/0014/001444/144423e.pdf

iHub Research, & Research Solutions Africa. (2012). *Mobile usage at the base of the pyramid in Kenya*. Retrieved from http://www.infodev.org/en/TopicPublications.34.html

Ilahiane, H., Hall, L., & Sherry, J. W. (2012). The problematics of the "bottom of the pyramid" approach to international development: The case of micro-entrepreneurs' use of mobile phones in Morocco. *Information Technology & International Development*, *8*(1), 13–26. Retrieved from http://itidjournal.org/itid/article/view/840

infoDev and Price Waterhouse Coopers. (2010). *Survey of information and communication technology initiatives for education in India and South Asia.* Retrieved from www.infodev.org/en/*Document.890.pdf*

International Institute for Communication and Development. (2013). *Mobile on the move: Opportunities in mobile learning from IICD's perspective*. The Hague, Netherlands: Author. Retrieved from http://www.comminit.com/clickthru/6be5e751f9893a4b8f6c3b28b0fded8d?node=9301321

International Labor Organization. (2012). *Rethinking economic growth: Towards productive and inclusive Arab societies*. Geneva, Switzerland: Author. Retrieved from http://www.ilo.org/public/english/region/arpro/beirut/downloads/events/2013/ilo-undp-13/report.pdf

International Labor Organization Committee on Youth Employment. (2012). Draft report. In International Labor Organization (Ed.), *International Labor conference*. Geneva, Switzerland: International Labor Organization. Retrieved from http://www.google.com/url?q=http://www.ilo.org/wcmsp5/groups/public/%40ed_norm/%40relconf/documents/meetingdocument/wcms_182840.pdf&sa=U&ei=W8u6UbD3A87_4AOHCQ&ved=0CB4QFjAC&sig2=oRkTRvJV-h3xSFU_vhV8Eg&usg=AFQjCNFzN21WEbL_1gbtWiDz0XOKtNLcEA

International Telecommunication Union. (2013). *The world in 2013: ICT facts and figures*. Geneva, Switzerland: Author. Retrieved from http://www.itu.int/ITU-D/ict/facts/material/ICTFactsFigures2013.pdf

International Youth Foundation. (2009). *Event proceedings: Employabiity, youth, opportunity.* Retrieved from www.iyfnet.org/sites/default/files/Nairobi_Proceedings_Report.pdf

Inveneo. (2012). *Haiti rural broadband initiative progress report: Q1 2012*. Retrieved from http://www.inveneo.org/files/Inveneo_HRBI_Q1_2012_Progress_Report_FINAL.pdf

IREX. (2012, October). *Empowering women and girls through ICT at libraries*. Retrieved from https://digital.lib.washington.edu/researchworks/handle/1773/20926

Isaacs, S., & Hollow, D. (2012). *eLearning Africa report 2012.* Berlin, Germany: ICWE. Retrieved from http://www.elearning-africa.com/pdf/report/ela_report_2012.pdf

Isbrandt, S. (2013). Mobile learning innovations for out-of-school youth in Mali [Session abstract]. Washington, DC: Education Development Center. Retrieved from http://convention2.allacademic.com/one/cies/cies13/index.php?click_key=2&cmd=Multi+Search+Search+Load+Publication&publication_id=659483&PHPSESSID=lvu06oulpgddvscglrj3mv9nl6

Jack, W., & Suri, T. (2010). *The economics of M-PESA* [Unpublished paper]. Retrieved from http://www.gsmworld.com/mobilefordevelopment/wp-content/uploads/2012/06/mpesa_d_1540.pdf

JBS International. (2012d). *USAID youth policy and learning project: youth education in crisis and conflict*. Washington, DC: USAID. Retrieved from http://www.google.com/url?q=http://www.jbsinternational.com/site/News%2520Attachments/USAID%2520Youth%2520Policy%2520and%2520Learning%2520Project%2520Briefing%2520Paper%2520on%2520Youth%2520Education%2520in%2520Crisis%2520and%2520Conflict,%2520Draft.pdf&sa=U&ei=0em6UbfTKIXW9ATLuoDQCA&ved=0CBgQFjAA&sig2=TqasqbZr9EgwcZOzPukQJQ&usg=AFQjCNF2PTJEFcwI1kobePUGzk4A1sVlOg

Johnston, K. A., Andersen, B. K., Davidge-Pitts, J., & Ostensen-Saunders, M. (2009). Identifying student potential for ICT entrepreneurship using Myers-Briggs personality type indicators. *Journal of Information Technology Education, 8.* Retrieved from www.jite.org/documents/Vol8/JITEv8p029-043Johnston281.pdf

Knowledge Works. (2012). *Recombinant education: Regenerating the learning ecosystem*. Retrieved from knowledgeworks.org/sites/default/files/u1/Forecast3_0.pdf

Kumar, A., Tewari, A., Shroff, G., Chittamuru, D., Kam, M., & Canny, J. (2010). An exploratory study of unsupervised mobile learning in rural India. In *Proceedings of the 28th international conference on human factors in computing systems.* New York, NY: ACM. doi:10.1145/1753326.1753435

Labrique, A., Vasudevan, L., Chang, L. W., & Mehl, G. (2012). Letter to the Editor H Pe for mHealth: More “y” or “o” on the horizon? *International Journal of Medical Informatics*, *82*(5), 467–469. Retrieved from http://www.ijmijournal.com/article/S1386-5056(12)00240-7/abstract

Lewis, J., & Landeros, E. (2002, September). The impact of new technologies on the lives of disabled Central Americans: A model to increase employment and inclusion. *Technologies at Work*, 19–23. Retrieved from www.techknowlogia.org/TKL_Articles/PDF/414.pdf

Making Cents International. (2012a). *2012 state of the field in youth economic opportunities: A guide for programming, policymaking, and partnership building*. Retrieved from http://www.youtheconomicopportunities.org/SiteManager/CuteEditor_Files/uploads/YME_SOTF2011_Interactive_new.pdf

Making Cents International. (2012b). *Annex III: 2010–2012 resources on youth economic opportunities: Articles, briefs, interviews, papers, technical notes and videos*. Retrieved from https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CEAQFjAA&url=http%3A%2F%2Fwww.gyin.org%2Findex.php%3Foption%3Dcom_k2%26view%3Ditem%26task%3Ddownload%26id%3D1_ea14e58eba41aa68bb6f4f5e3762d528%26Itemid%3D336%26lang%3Den&ei=LCUEUaOOEqqs2gWWwYHYCQ&usg=AFQjCNEL2fNkPThGpelOgwYFnhXiHLR8Cg&sig2=zwTAfiKYyentVEy-awf4QA&bvm=bv.41524429,d.b2I

Manduchi, R., & Coughlan, J. (2008). *Portable and mobile systems in assistive technology. Introduction to the special thematic session.* Retrieved from http://users.soe.ucsc.edu/~manduchi/papers/STS-Intro.pdf

Mariscal, J., & Gutierrez, L. H. (2009). Employment and youth inclusion into the labor force via training in information and communication technologies (ICTs): The cases of Brazil, Colombia, and Mexico. *Information Technologies and International Development, 5*(2), 19–30. Retrieved from itidjournal.org/itid/article/viewFile/358/159

Marom, R. (2013). *Opportunities without borders: Realizing the promise of neo-urbanization*. Retrieved from http://www3.alcatel-lucent.com/sustainability/opportunities-without-borders/index.html

Marriott. (2012). *2011–2012 Sustainability report*. Retrieved from http://www.marriott.com/Multimedia/PDF/CorporateResponsibility/MarriottSustainabilityReport_2011and2012condensed4MB.pdf

Martin, B. L., & Hall, H. (2011). Mobile phones and rural livelihoods: Diffusion, uses, and perceived impacts among farmers in rural Uganda. *Information Technologies & International Development*, *7*(4), 17–34. Retrieved from http://itidjournal.org/index.php/itid/article/download/789/330

McKinsey & Company. (2012). *Education to employment: Designing a system that works. Executive summary*. Retrieved from http://mckinseyonsociety.com/downloads/reports/Education/Education-to-Employment-exec-summary_FINAL.pdf

mEducation Alliance. (2012b, October 15). Innovations in mobiles for youth workforce development. *Learning Series Event.* Event conducted by USAID, Washington, DC.

Microsoft. (2013a). Employability portal: Catalyzing employability skills. *Mendeley.* Retrieved from http://www.mendeley.com/research/employability-portal-catalyzing-employability-skills/

Microsoft. (2013b). *Magellan: Preparing today's students for tomorrow's economy*. Retrieved from http://www.google.com/url?q=http://download.microsoft.com/download/B/B/3/BB39CA9C-79B8-49A7-B867-824B8C6C6298/TheMagellanProject.pdf&sa=U&ei=4Na6UZ2_LK614AOc7YGwBA&ved=0CBgQFjAA&sig2=eSn2OQlvY_ZEYvilLy3HPg&usg=AFQjCNG4Xpv160lrjjekHj8CnG7sYhky5w

Microsoft, & International Youth Foundation. (2013). Build your business. *International Youth Foundation.* Retrieved from http://iyf.ontidwit.com/ContentItem/View/b44cf46c-13c2-46dd-b78c-446728df9dda

Mourshed, M., Farrell, D., & Barton, D. (2012). *Education to employment: Designing a system that works*. New York, NY: McKinsey Center for Government. Retrieved from http://mckinseyonsociety.com/downloads/reports/Education/Education-to-Employment_FINAL.pdf

mWomen, VISA, & Bankable Frontier Associates. (2013). Unlocking the potential: Women and mobile financial services in emerging markets. Retrieved from http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/02/GSMA-mWomen-Visa_Unlocking-the-Potential_Feb-2013.pdf

My.Coop. (2011). *Mobile learning toolkit*. Retrieved from http://www.google.com/url?q=http://miyaichi.up.seesaa.net/image/Mobile20Learning20Toolkit20ILO20my.coop202011.pdf&sa=U&ei=yti6UfCiOrL-4APZsIHABw&ved=0CCUQFjAC&sig2=tJfEahOQFpJVla-wPmkjwQ&usg=AFQjCNFsutt2Z_Ounir9kaCWqlOOM5wNIQ

Nokia. (2009). *Nokia life tools data sheet.* Retrieved from http://www.nokia.com/NOKIA_COM_1/Microsites/Entry_Event/phones/Nokia_Life_Tools_datasheet.pdf

Nokia, & UNESCO. (2012). *Mobile learning and policies: Key issues to consider*. Retrieved from unesdoc.unesco.org/images/0021/002176/217638E.pdf

OECD. (2012). *Better skills better jobs better lives: A strategic approach to skills policies*. Retrieved from *skills.oecd.org/documents/OECDSkillsStrategyFINALENG.pdf*

Opera. (2012, July). *State of the mobile web, March 2012. Africa's mobile web atlas.* Retrieved from www.opera.com/media/smw/2012/smw062012.pdf

Pace, D., Merritt, S. M., & Lee, R. L. (2010). *Use of mobile phone computing for development of student 21st century skills. Final report: Use of mobile phone computing.* Retrieved from http://digitalcommons.pace.edu/cgi/viewcontent.cgi?filename=0&article=1020&context=cornerstone2&type=additional

Peterman, A., Behrman, J., & Quisumbing, A. (2011). *A review of empirical evidence on gender differences in non-land agricultural inputs, technology, and services in developing countries* [Working Paper]. Retrieved from http://www.fao.org/docrep/013/am316e/am316e00.pdf

Plan Canada. (2010, September). *Youth economic empowerment: An integrated approach addressing youth poverty in Niger, Senegal and Sierra Leone* [PowerPoint slides]. Presented at the 2010 Global Youth Enterprise & Livelihoods Development Conference, Washington, DC. Retrieved from http://yfslink.org/files/presentations-files/Plan%20WARO%2013Sept2010.ppt-Final.ppt

Plan International. (2012a). *Because I am a girl. Executive summary.* Retrieved from http://www.plan-uk.org/assets/Documents/pdf/because-i-am-a-girl-2012-executive-summary.pdf

Plan International. (2012b). *Youth economic empowerment – A pilot programme of Plan International 2010–11. Indonesia case study.* Oxford, UK: INTRAC. Retrieved from. Retrieved from http://www.suyadi.com/yeeplan/Synthesis%20report_FINAL_2012-05-21.pdf

Power, T., & Sankale, J. (2007, April). *In the palm of your hand: Supporting rural teacher professional development and practice through the use of mobile phones and other handheld digital devices.* Retrieved from oro.open.ac.uk/17800/

Price, J. K. (2004). Evaluating effective teaching and learning within complex levels of interaction. Santa Clara, CA: Intel. Retrieved from http://download.intel.com/education/evidenceofimpact/IntelEducation_Evaluating_Effective_Teaching_Learning.pdf

Purwandari, B. (2010, April). *The impact of the mobile web in developing countries*. Retrieved from http://eprints.soton.ac.uk/271531/

Rausch, T. (2010). *The DrumNet Project: Lessons learned from an ICT initiative in Kenya's agricultural sector*. Retrieved from http://www.prideafrica.com/assets/docs/AITEC.pdf

Research ICT Africa. (2012). *Internet going mobile: Internet access and usage in 11 African countries*. Cape Town, South Africa: Author. Retrieved from http://www.researchictafrica.net/publications/Presentations/2012 Stork Calandro Gillwald - Internet Going Mobile.pdf

Research ICT Africa, & Intelecon. (2012). *Mobile usage at the base of the pyramid in South Africa*. Retrieved from http://www.infodev.org/en/Publication.1193.html

Results for Development. (2012). *Innovative models for skills enhancement in Africa and Asia. Innovative models for skills enhancement in Africa and Asia*. Retrieved from http://www.google.com/url?q=http://www.resultsfordevelopment.org/sites/resultsfordevelopment.org/files/resources/ISESE%2520Models%2520Synthesis_Final.pdf&sa=U&ei=i-C6Ubu6AY-84APW0YEI&ved=0CBgQFjAA&sig2=IKYHe1ZrzEnKUVKiKWc7rg&usg=AFQjCNFA66wBQV8AkFVwpuDPDhfSCECmfA

Results for Development. (2013). *Training models for employment in the digital economy*. Washington, DC: Author. Retrieved from http://resultsfordevelopment.org/sites/resultsfordevelopment.org/files/resources/ICT%20Models%20Report.pdf

Rockefeller Foundation, & Global Business Network. (2010). *Scenarios for the future of technology and international development*. New York, NY: Author. Retrieved from http://www.gbn.com/articles/pdfs/GBN&Rockefeller%20scenarios.technology&development.pdf

RTI. (n.d.). *Workforce development: Investing in today's workforce. Preparing for tomorrow's opportunities*. Retrieved from www.rti.org/idg

Sey, A., & Fellows, M. (2009). *Literature review on the impact of public access to information and communication technologies*. Seattle, WA: Center for Information & Society. Retrieved from http://library.globalimpactstudy.org/sites/default/files/docs/CIS-WorkingPaperNo6.pdf

Shaqodoon. (n.d.). Shaqodoon overview. *Shaqodoon.* Retrieved from http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CCcQFjAB&url=http://www.shaqodoon.org/Documents/Shaqodoon NGO - One Pager - April2012.pdf&ei=C5Y7ULiyMIXI2wW1s4GgCQ&usg=AFQjCNGQS-miZxZPfXuuLR-NkrM_RZK3PA&sig2=JfhQVu4ZYVCrXqrOatxs4Q

SIDA. (2010). *The innovative use of mobile applications in East Africa*. Retrieved from http://upgraid.files.wordpress.com/2010/06/sr2010-12_sida_hellstrom.pdf

Simel, E., Malhotra, A., Mathur, S., Duron, G., Johnson-Welch, C. (2001). *Making it work: Linking youth reproductive health and livelihoods*. Retrieved from http://www.icrw.org/files/publications/Making-it-Work-Linking-Youth-Reproductive-Health-and-Livelihoods.pdf

Somali Center for Women Empowerment. (2011). *Somali Youth Livelihood Program (SYLP)*. Retrieved from http://www.socwe.org/file/40.pdf

Souktel. (n.d.). Changing lives. One text message at a time. *Souktel.* Retrieved from http://www.souktel.org/component/content/article/3-content/38-changing-lives-one-text-message-at-a-time.html

Souktel. (2011a). Our story. *Souktel.* Retrieved from http://www.souktel.org/about/our-story.html

Stavropoulou, M., & Jones, N. (2013). *Off the balance sheet: the impact of the economic crisis on girls and young women. A review of the evidence.* London, UK: Plan International. Retrieved from http://plan-international.org/files/global/publications/economics/off-the-balance-sheet-english

Swarts, P., Clarke, D., Hooker, M., Palmer, L., & Wachira, E. (2011, May). *Re-engineering education and training for economic and social development in the 21st Century: A focus on technology and skills development in national education and training systems in Africa.* Retrieved from http://www.ictworks.org/sites/default/files/uploaded_pics/2011/GESCI_MRT_Issues_Paper_Final_version_May2011.pdf

Talyarkhan, S. (2004). *Connecting the first mile: a framework for best practice in ICT projects for knowledge sharing in development.* Retrieved from http://practicalaction.org/docs/icts/ict_best_practice_framework.pdf

Temkin, B. (2009). Informal self-employment in developing countries: Entrepreneurship or survivalist strategy? Some implications for public policy. *Analyses of Social Issues and Public Policy*, *9*(1), 135–156. doi:10.1111/j.1530-2415.2009.01174.x

Tierney, T. (Ed.). (2013). *Women in the global economy: Leading social change.* New York, NY: Institute of International Education.

TNS. (n.d.). *Life at the BoP - Understanding user lives and needs in Tanzania, India and Senegal among smallholder farmers, women entrepreneurs, and youth*. Retrieved from http://www.google.com/url?q=http://africa.comworldseries.com/wp-content/uploads/2344Life_at_BoP_compressed.pdf&sa=U&ei=y-a6UeKWN7jK4APF4oGoAw&ved=0CBgQFjAA&sig2=0QSbHc6dIB7frqpuNZsE6g&usg=AFQjCNGM32hV7gkoPoiPe7tq2iqu2Xjjgw

Tomlinson, M., Rotheram-Borus, M. J., Swartz, L., & Tsai, A. C. (2013). Scaling up mHealth: Where is the evidence? *PLoS Medicine*, *10*(2). doi:10.1371/journal.pmed.1001382

UNDP. (2012). *Mobile technologies and empowerment: Enhancing human development through participation and innovation*. Retrieved from http://www.undp.org.za/remository/func-startdown/342/

UNESCO. (2012a). *Education and skills for inclusive and sustainable development beyond 2015.* Retrieved from http://www.un.org/millenniumgoals/pdf/Think Pieces/4_education.pdf

UNESCO. (2012b). *EFA global monitoring report 2012. Youth and skills: Putting education to work. Executive summary*. Paris, France: Author. Retrieved from http://unesdoc.unesco.org/images/0021/002175/217509E.pdf

UNESCO. (2012c). *UNESCO policy guidelines for mobile learning*. Retrieved from http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/pdf/UNESCO_Policy_Guidelines_on_Mobile_Learning_DRAFT_v2_1_FINAL__2_.pdf

UNESCO. (2013). *UNESCO mobile learning week symposium report*. Paris, France. Retrieved from http://www.unesco.org/new/en/unesco/themes/icts/m4ed/unesco-mobile-learning-week/

UNESCO, & Nokia. (2012a). *Mobile learning for teachers: Global themes*. Retrieved from unesdoc.unesco.org/images/0021/002164/216452E.pdf

UNESCO, & Nokia. (2012b). *Turning on mobile learning: Global themes*. Retrieved from unesdoc.unesco.org/images/0021/002164/216451E.pdf

UNICEF. (2011). *Adolescence an age of opportunity*. Retrieved from http://www.unicef.org/sowc2011/pdfs/SOWC-2011-Main-Report_EN_02092011.pdf

United Nations Girls' Education Initiative. (2012a). *The gender dimensions of the school-to-work transition: Follow-up study*. New York, NY: Author. Retrieved from http://www.ungei.org/resources/files/stw_gender_dimensions.pdf

United Nations Girls' Education Initiative. (2012a). *Gender and skills development*. Retrieved from www.ungei.org/files/UNGEI_Gender_and_Skills_Print_v1_3.pdf

USAID. (n.d.). *Foreign assistance standardized program structure and definitions*. Washington, DC: Author. Retrieved from http://ghiqc.usaid.gov/tasc3/docs/650-09-313/annex_x.pdf

USAID. (2009). *Building alliances series: Workforce development*. Washington, DC: Author. Retrieved from http://www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED507880

USAID. (2010). *Rwanda youth employment assessment report*. Washington, DC: Author. Retrieved from http://transition.usaid.gov/rw/our_work/elibrary/docs/rwandayouthassessment.pdf

USAID. (2011a). *Community Youth Mapping*. Retrieved from www.equip123.net/docs/e3-CommunityYouthMappingReportHaiti.pdf

USAID. (2011b). *Education opportunity through learning: USAID education strategy*. Washington, DC: Author. Retrieved from www.ungei.org/resources/files/usaid_education_policy05.pdf

USAID. (2011c). *First Principles: Designing Effective Education Programs Using Information and Communication Technology (ICT)*. Retrieved from www.equip123.net/docs/E1-FP_*ICT_Compendium.pdf*

USAID. (2011d). *Promising Youth Development Strategies: Youth Service Programs*. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/Promising%20Youth%20Development%20Strategies%20-%20Youth%20Service%20Programs.pdf

USAID. (2011e). *USAID policy framework 2011-2015.* Washington, DC: Author. Retrieved from http://www.usaid.gov/sites/default/files/documents/1870/USAID%20Policy%20Framework%202011-2015.PDF

USAID. (2012a). *EQUIP3 lessons learned: Experiences in livelihoods, literacy and leadership in youth programs in 26 countries*. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/EQUIP3%20Lessons%20Learned%20-%20Book_0.pdf

USAID. (2012b). *Gender equality and female empowerment policy*. Washington, DC: Author. Retrieved from http://www.usaid.gov/sites/default/files/documents/1870/GenderEqualityPolicy.pdf

USAID. (2012c). *PAJE-Nièta: Mobile learning for youth*. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/PAJE-Ni%C3%A8ta%20Mali%20Support%20to%20Youth%20Entrepreneurs%20Project.pdf

USAID. (2012d). *YCoP links: The next generation*. Retrieved from http://idd.edc.org/sites/idd.edc.org/files/YCoP%20Links%20-%20The%20Next%20Generation.pdf

USAID, & FHI360. (2010a). *African agriculture and ICT: An overview*. Retrieved from http://microlinks.kdid.org/sites/microlinks/files/resource/files/FACETProgramOverview.pdf

USAID, & FHI360. (2010b). *ICT to enhance farm extension services in Africa*. Retrieved from http://microlinks.kdid.org/sites/microlinks/files/resource/files/FACETExtensionServices.pdf

USAID, & International Youth Foundation. (2010a). *Ensuring demand-driven youth training programs: How to conduct and effective labor market assessment*. Baltimore, MD. Retrieved from http://library.iyfnet.org/sites/default/files/library/Labor_Mkt_Assess.pdf

USAID, & International Youth Foundation. (2010b). *Findings from a rapid community appraisal in Jordan.* Retrieved from http://www.iyfnet.org/document/1059

USAID, & m4Ed4Dev. (2011). *2011 International Mobiles for Education for Development Symposium summary report.* In JBS International (Ed.), *2011 International Mobiles for Education for Development Symposium* (p. 51). Washington, DC: USAID. Retrieved from http://www.meducationalliance.org/docs/m4Ed4Dev_Symposium_2011_Summary_Report_Final.pdf

USAID, Catholic Relief Services, & World Concern. (2009). *InclusIon of VIetnamese with DIsabilities Project. Best practices from project experience*. Retrieved from pdf.usaid.gov/pdf_*docs/PDACR437.pdf*

Viberg, O. (2012). *Mobile assisted language learning: A literature review*. Retrieved from ceur-ws.org/Vol-955/papers/paper_8.pdf

Wang, L., Luo, J., Gao, W., & Kong, J. (2012). The effect of Internet use on adolescents' lifestyles: A national survey. *Computers in Human Behavior*, *28*(6), 2007–2013. doi:10.1016/j.chb.2012.04.007

Winthrop, R., & Smith, M. S. (2012). *A new face of education: Bringing technology into the classroom in the developing world.* Washington, DC: Brookings Institution. Retrieved from http://www.mobileactive.org/files/file_uploads/01_education_technology_shearer.pdf

Woodard, J. (2012, June 15). *MFARM profile.* Retrieved from https://communities.usaidallnet.gov/ictforag/file/284/download/330

The World Bank. (2012a). *ICT for greater development impact: Information and communication technology sector strategy*. Washington, DC: Author. Retrieved from http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/WBG_ICT_Strategy-2012.pdf

The World Bank. (2012b). *Maximizing mobile. Part II: Statistical appendix*. Washington, DC: Author. Retrieved from http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/IC4D-2012-Appendix-1.pdf

The World Bank. (2012c). *Youth employment programs: An evaluation of World Bank and IFC support*. Washington, DC: Author. Retrieved from http://ieg.worldbankgroup.org/content/dam/ieg/ye/ye_eval.pdf

The World Bank. (2013). *World development report 2013: Jobs.* Washington, DC: Author. Retrieved from http://siteresources.worldbank.org/EXTNWDR2013/Resources/8258024-1320950747192/8260293-1322665883147/WDR_2013_Report.pdf

The World Bank, & The African Development Bank. (2012). *The Transformational Use of Information and Communication Technologies in Africa*. Retrieved from http://siteresources.worldbank.org/EXTINFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/282822-1346223280837/MainReport.pdf

Worldreader. (2012a). *Operations report, June 2012*. Retrieved from http://www.worldreader.org/uploads/Worldreader Ops Report Jun-2012.pdf

Wyche, S. P., Schoenebeck, S. Y., & Arbor, A. (2013). *"Facebook is a luxury." An exploratory study of social media use in rural Kenya.* Retrieved from yardi.people.si.umich.edu/pubs/Yardi_*FacebookLuxury13.pdf*

Youth Employment Network. (2010). *Benchmarks for youth employment*. Retrieved from http://www.ilo.org/public/english/employment/yen/downloads/benchmark2011.pdf

Zeitlin, A. (2011). *When does community monitoring improve school performance?* Retrieved from http://www.google.com/url?q=http://www.iig.ox.ac.uk/output/briefingpapers/pdfs/iiG-briefingpaper-18-community-monitoring.pdf&sa=U&ei=__G6UdTiKrG14AP2xYHoAw&ved=0CBgQFjAA&sig2=zb6NtlpFUyBv26OJ-EEZ2w&usg=AFQjCNHQL671mrSsHf1RUFEEpFDq5hWrXw

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