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Researching the links between ICT skills and Employability: An Analytical Framework

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Researching the links between ICT skills and Employability: An Analytical Framework

ABSTRACT

This article proposes an analytical framework to better understand the role of ICT skills in improving employment opportunities for low-income groups. The research draws upon the experiences of seventy NGOs that provide ICT training programs and other employment services in 23 countries around the world and explores the linkage between ICT skills and employability through three different levels of analysis: 1) From the characteristics of the NGO's training programs and how they are tailored to different target groups; 2) Through the nature and dynamics of the NGO's relationships with employers, donors, government agencies and other social organizations and the way that these networks impact employability outcomes; and 3) From the factors both at the individual (beneficiary) level and at the macroeconomic level that influence employment dynamics and program impact. The researchers argue that basic ICT skills are a necessary but not a sufficient condition for disadvantaged groups to improve their employment situation. The multi-level framework identifies some of the common elements that help situate the role of basic ICT skills in relation to other skills, the thresholds people cross when navigating through the employability path, and those factors that can facilitate or impede this pathway.

Keywords: ICTD, ICT and employability, networks and development, basic ICT skills, e-Skills

I. THE LINK BETWEEN BASIC ICT SKILLS AND EMPLOYABILITY | RELEVANCE FOR ICTD RESEARCH

The diffusion of ICT across all economic sectors is placing new demands in workers skills while expanding employment and economic opportunities for disadvantage groups. In today's job market, basic ICT skills are considered crucial for people entering the workforce and a must-have for those trying to find a better-paid job. For governments, having an ICT-skilled workforce is considered a strategic asset to spur economic growth, promote competitiveness, and business productivity. The global economic and employment trends are increasingly influenced by these dynamics and "thus dependent on both the effective use of ICT for businesses and industrial processes and on the knowledge, competences, and skills of current and new employees" [1: 2].

The penetration of ICT in a variety of economic activities is not only cutting across sectors, but also, across different types of jobs. Once, those basic ICT skills commonly assumed to be an entry ticket for getting a job in IT-intensive industries today they are becoming increasingly important for traditional sectors such as agriculture, construction, micro-entrepreneurship, to name a few. This trend is not only visible across sectors, but also across business hierarchies and different types of job positions. In many countries, particularly developed but increasingly in developing ones, ICT-related occupations represent twenty to thirty percent of the total national employment share with ICT specialists[1] accounting for three to four percent, and jobs requiring basic ICT skills accounting for the rest [2]. It is precisely in the latter type of jobs where we see the linkage between ICT, employability, and the relevance for ICTD.

Against this backdrop, the understanding of the linkages between basic ICT skills and employability is of utmost importance for the field of ICTD. Despite the growing body of literature on ICT and development, most of the research that addresses the relationship between ICT skills and employment focuses on the labor demands specific to the ICT sector – i.e. software industry – and in the economic opportunities available for rural communities through models such as the business processes outsourcing centers, firmly established in countries like India [3-7]. Few studies,

[1] The OECD Information Technology Outlook (2006: 216) defines ICT specialists as: "[individuals] who have the ability to develop. Operate and maintain ICT systems, ICTs constitute the main part of their job".

however, address the linkage between ICT and employability beyond the ICT sector [8-10] and even fewer studies explore the role of NGOs as intermediaries or bridges between disadvantaged groups and the labor market [11-14]

We argue that in order to build a more comprehensive picture of the role of ICT skills in improving employment and economic opportunities for low-income groups, it is necessary to identify those common elements that come together to help individuals enter and navigate the employability path. The elements, if isolated, only tell part of the story. However, the relationships among these elements, the employment dynamics present in a wide variety of localities, and the factors that facilitate or impede the navigation through the employability pathway can help researchers put into context the extent to which basic ICT skills contribute to improve economic opportunities for disadvantaged groups or if they contribute at all.

The current dynamics in the labor market and the strategic importance of basic ICT skills render a fruitful opportunity for ICTD research to shed light on the linkages between these skills and employability. With this objective in mind, this article proposes an analytical framework to better understand the contribution of basic ICT skills to increase the employment and economic opportunities of disadvantaged groups. The framework builds upon the experiences of seventy NGOs that provide ICT training programs and other employment services through their telecenters or community technology centers (CTCs) in Asia[2], Latin America[3], Europe[4], and the United States[5]. To understand some of the linkages between ICT skills and employability the framework incorporates three levels of analysis: 1) The programmatic characteristics of NGO ICT training programs and other employment services in different contexts and with a variety of target groups; 2) The NGOs' expanded social networks and how the ties with a wide array of actors affect employability outcomes; and 3) The factors at the individual and at the community level that influence these dynamics and program impact.

For the purpose of this research, basic ICT skills are defined as: "The capabilities required for effective application of ICT systems and devices by the individual. ICT users apply systems as tools in support of their own work, which is, in most cases, not ICT. User skills cover the utilization of common generic software tools and the use of specialized tools supporting business functions within industries [in addition] to the ICT industry" [1: 5].

For the purposes of gauging the labor force benefits of NGO basic ICT skills training programs, this research is guided with several components of the meaning of employability: the ability to secure a job; the ability to keep an existing job or to improve that position in quality or income; the ability of beneficiaries to use elements of the training programs as platforms to gain job experience if new to the labor market; and the ability to contribute to the overall productivity of business, government, and social labor [13]

Framing the research question around the concept of the impact that ICT skills have in employability is probably futile, since it is extremely hard to pinpoint exactly what combination of elements between individual factors, characteristics of the training programs and other external factors that affect the employability pathway will generate a specific outcome. The dynamics of these elements and the specificities of each locality, represents, from this point of view, a methodological challenge. For this reason, a more productive way of thinking about the relationship between ICT skills and employability some of the common elements that play a role in this relationship and how these elements, if present, interact in different socio-economic settings.

II. THEORETICAL FOUNDATIONS

In general terms, the theoretical backbone of this research is founded on fifty years of literature in development communication. As early as the 1950's, when modernization approaches guided the practice and theory of development, communication technologies (particularly mass media) were seen as mechanisms to achieve economic

[2] Australia, India, New Zealand, Philippines, Taiwan, and Vietnam.

[3] Brazil, Colombia, Guatemala, and Mexico.

[4] Austria, Bulgaria, Czech Republic, Denmark, Estonia, Finland, Ireland, Latvia, Poland, Romania, Russia, and Turkey.

[5] Cities in the United States: Austin, Boston, Chicago, New Orleans, New York, Portland, Seattle, Tacoma, and Virginia.

growth, increase literacy, and spread the values of modernity within traditional societies [15-17]. Guided throughout its history by three main theoretical paradigms – Modernization (50's - 60's), Dependency (late 60's – 70's), and Participatory Communications (80's – late 90's) – the field has left us with valuable insights in the theory and practice of ICT in social change.

In the last twenty years, participatory approaches to development have become the centerpiece not only in development communication research but also in the practice of international organizations and in the design of public policies. Despite the optimism surrounding this approach there have been no evident results about its efficiency in generating visible development outcomes for marginalized communities and in terms of empowering people to further participate in the economic, cultural and social realms of their societies One of the most prevalent criticisms is that participatory communication theories (and the practices) embrace the idea of empowerment without actually prescribing any methods for achieving structural change. In this view empowerment through participation has become just another "quick fix" to development [18, 19]. *Participatory development* is a normative approach, that is to say, it analyzes development "not in terms of how it actually takes place but rather how it should take place. The distinction between positive and normative, 'is' versus 'ought', has certainly contributed to some intellectual confusion in the field [of development communication]" [20: 160-161].

Today, the field faces a critical conjuncture [18] and in order for it to keep playing a role in furthering our knowledge about the dynamics of ICT and development it is necessary to integrate into the discussion those variables that reflect more closely the social realities we live today. Three of those variables are particularly relevant for the theoretical advancement of the field and to advance our understanding of the linkages between ICT skills and employability: 1) The economic, social, cultural and political dynamics created by the globalization process and how these dynamics impact the employment and economic opportunities for low-income groups; 2) The importance of placing development within the context of the discourse and practices of power and in turn, how the dynamics embedded within these power structures facilitate or impede social change; and 3) The need to integrate into the analysis the different dynamics and social interactions made possible by innovative technologies in ICT (mobile phones, blogs, social networking sites, etc.) and the ways their use can have an effect in the development process.

In terms of research specifically related to the contribution of ICT skills to employability, Chapple's [10, 11] is perhaps one of the most influential for the field and for the analytical study elaborated in this article. Focusing on the high-tech regional corridors in the United States – San Francisco Bay Area, New York-New Jersey-Connecticut, etc – she elaborates a comparative analysis of the training providers that help low-income groups to set a foot into the IT labor market. Her findings show that non-for-profit organizations "with the ability to connect to local industry and teach the skills and language of the 'switched on'" [10: 549] are the most effective in helping disadvantaged communities enter the IT labor.

Other relevant literature on ICT and work focus on the diffusion of computer use among different types of jobs and the effect that computer skills have in workers' compensation and wages differentials [21-25]. For example, Green et al. argue that the effect on ICT in productivity and wage differentials is greater for those employees that have the ability to assess "the potential benefits to be gained from successful ICT use and [are] able to persuade, influence, and educate others in the workplace" [21: 67]. Their analysis shows that employees that computer skills have a significant impact on pay (5.3% and 6% for men and women respectively), but this effect is interdependent to what the authors defined as influence skills.

III. METHODOLOGY

The analytical framework presented in this article is the product of two years of research undertaken by the Center for Information and Society at the University of Washington that started in July 2006. Effectiveness of information and communication technology (ICT) interventions is notoriously difficult to measure. Intended beneficiaries face interconnected challenges that defy simple causality models and fragmented solutions. In the most compelling examples, ICT programs reinforce and complement a variety of services, often in subtle ways [21]. For this reason, the

team of researchers developed a multi-method approach that used a combination of qualitative methods and, to a lesser extent, quantitative research methods to identify common and unique elements of NGOs ICT training programs in different social and economic contexts, the roles of different actors in the organizations' social networks, and the factors at the individual beneficiary level and at the external level that impact employability outcomes.

A. Qualitative methods

Over the period of two years, the research team conducted semi-structured phone and in-person interviews with the staff and trainers of seventy NGOs that provide ICT training and employment services in twenty-three countries. The NGOs were selected using the following criteria: 1) Geographical representation; 2) Diversity of target groups; and 3) Organizations that included employability among their social goals. In total, the research team interviewed two hundred and fifty NGO staff and ICT trainers and conducted field visits to one hundred urban, rural and semi-rural telecenters or community technology centers twenty-five countries starting in 2006.

Storytelling as a method to gather individual-level data

As part of a larger research strategy to address how the linkages between ICT skills and employability emerge at the individual level, two CIS researchers developed a storytelling methodology to profile organizations that provide basic ICT training, and people that have received that training [*ibid*]. The evidence narratives, as the researchers call them, pay careful attention to uniquely local details surrounding the people, organizations and communities in which ICT programs are embedded in order to reveal more general lessons. The goal is to describe the contribution of ICT training on a range of trainees, including the "typical" students, rather than solely on the "poster-child" who often is held up as an example but whose circumstances may be quite untypical. An evidence narrative should capture the rhetorical and explanatory power of an in-depth and contextualized case within a framework that is conscious of representativeness and generalizability.

By explicitly orienting success stories toward representativeness, evidence narratives aim to humanize beneficiaries and to illuminate detailed, concrete lessons for practitioners, researchers and donors to carry forward into future work. Everybody remembers and responds to heartwarming stories. But for those committed to understanding and affecting social change, heartwarming stories are valuable to the degree their lessons can be applied and acted upon. Following this method, the research team interviewed two-hundred current and former beneficiaries of ICT training programs and produced twenty-four individual stories[6]. These stories highlight examples of ICTD implementations that illustrate important aspects of the featured settings. Taken together, the examples describe and reveal larger themes about core aspects of ICTD, especially on employability, income generation and other economic dimensions.

B. Quantitative Methods

To validate some of the findings emerging from the interviews and field visits, the team implemented a web-based survey using targeted sampling. We received seventy-five responses from NGOs in the United States and Europe. This survey was critical to further understand the structure, dynamics, and roles of the actors that are part of the NGOs social networks and the way in which these formal and informal ties expand training and employment opportunities for their beneficiaries. Many of the organizations that filled the survey also participated either in the interviews and/or the field visits. For this reason they are not counted separately from the total number of organizations that participated in the research.

The framework follows the principles that guide grounded theory. This method was developed by two sociologists, Barney Glaser and Anselm Strauss in the late 1970's and categorized empirically collected data to build a general theory that fits these data. As Strauss & Corbin [REF No: 12] elegantly stated: "[grounded theory] is a theory that was derived from data, systematically gathered and analyzed through the research process. In this method, data collection, analysis,

[6] For the rationale behind the evidence narratives methodology and the stories see: http://www.cis.washington.edu/ictd/ebhis.htm

and eventual theory stand in close relationship with one another. Using this method, the researcher builds a theory rather than testing a preexisting one and helps her/him to consider alternative meanings of different phenomena (*ibid*)."

IV. THE LINKS BETWEEN ICT SKILLS AND EMPLOYABILITY | AN ANALYTICAL FRAMEWORK

Non-governmental organizations play a key role as intermediaries between disadvantage groups and the labor market. More than three hundred NGOs around the world provide basic ICT skills training and a wide range of employment services to prepare a workforce that meets the demand for technology and other skills in today's labor market. Even though NGOs are only one provider of basic ICT skills among many, we argue that these organizations are particularly suited to function as intermediaries between the most disadvantaged groups and the labor market specially if compared against private training providers, and even in some cases, government programs [10, 11]:

- Many NGOs have well established and trustworthy relationship with the communities they serve and in many cases they represent an important social hub where people can learn and develop a variety of social skills from the interaction with other trainees and have the opportunity to expand their social network;
- Several NGOs incorporate employability outcomes within their social missions making basic ICT training and other services more accessible for higher-at-risk groups (immigrant groups, people with physical disabilities, etc.);
- In many places, NGOs are one of the few if not the only providers of basic ICT training that is affordable or free for low-income groups;
- These organizations function as bridges to expanded social networks opening opportunities for disadvantaged communities to develop new ties, new relationships to learn different social skills that are just as important as ICT skills to succeed in the labor market;
- Along the same lines, NGOs often design ICT training programs using technology both, as a means to acquire new competences and as a catalyst to develop other skills that are pivotal to succeed in the labor market [Sullivan, BGCA] such as team work, collaboration, communication, among others.

Using NGOs' ICT training and employment programs as proxies the framework integrates three levels of analysis to identify the elements that can potentially link ICT skills to employability:

Level 1 | the characteristics of the NGO's ICT and training and employment programs and how they are tailored to different target groups;

Level 2 | the nature and dynamics of the NGO's relationships with employers, donors, government agencies and other social organizations and the way that these networks impact employability outcomes;

Level 3 | the factors both at the individual (beneficiary) level and at the macroeconomic level that influence employment dynamics and program impact.

Level 1: NGO ICT training and employment programs

NGO programs vary according to the needs of the local context and the target groups. Broadly, the ICT training and employment programs included in the research share a set of common general elements: they are tailored to the needs of the local job market along with the needs of their target group, the organizations work closely with employers to provide networking and on-the-job training opportunities beneficiaries, and many offer other employment services and other skills training in addition to ICT. In a nutshell, the characteristics of the NGO training programs and their linkage to employability can be determined by looking at: a) What criteria organizations use to select participant of their programs; b) How they approach and tailored ICT training; c) What combination of employment-related services and

other training they are able to provide; and d) The extent to which the training and the services are tailored to the needs of the local market.

Trainee Selection Factors | Who do they train?

NGOs' program design target different types of trainees and based on the criteria they use to welcome people into their programs has a different implications for employability outcomes. In general terms, three trainee types stem from the findings:

1. General Population – organizations that open their training programs to anybody who walks into their door.
2. Targeted Population – organizations that design programs for a specific group, for example, women, people with physical disabilities, immigrants, youth, etc.
3. Cream of the crop – organizations that welcome trainees using a pre-selection process and a high bar for admission. Some of the organizations that use this trainee selection criterion offer financial incentives to further commit their trainees once accepted into the training program.

It would be easy to hypothesize that NGO training programs that select the cream of the crop among low-income communities would have higher employability outcomes than organizations that are opened to the general public. However, trainee selection is only one element of NGO programs and the effectiveness on employment outcomes are also dependent upon what these trainees learn during the training, how they learn it, and what individual factors play a role on these outcomes.

ICT Training Approaches | What do they teach and how?

A discussion about the multiplicity of pedagogies that exist to teach ICT skills is outside the scope of this article. However, based on the NGOs social mission, the teaching strategies they implement, and the training materials they use, it is possible to clustered training approaches into three broad categories: Industry-specific training, Project-based training, and Skills-based training. The characteristics and organization capacity of the NGOs, the processes they follow to create ICT training programs, other practices differ according to these categories.

Industry-specific ICT training refers to training in which ICT skills are tailored for specific sectors of the economy (tourism, legal services, health, etc.). Similar to project-based training, industry-specific ICT training also integrates other types of skills that are relevant for a specific sector (for example, customer service skills for the tourism industry). Organizations that use this training approach often exhibit a more extensive relationship with employers since they need the expertise of the people in the industries to develop training materials, create on-the-job training opportunities, and even using them as trainers, job mentors, or class speakers. Many organizations that follow this approach tend to be more knowledgeable of the labor demands since their training programs need to be more in sync with the employment trends in the industries relevant for their localities.

Project-based ICT training it is training embedded within a locally relevant purpose and in the context of social issues. For example, trainees learn how to use spreadsheets by creating an inventory of the products available at the rural cooperative. This approach is very popular and definitely more engaging than the following model. However, it is less likely to yield employability outcomes if the training materials are too broad or too generic.

Skills-based ICT training refers to stand-alone training on ICT applications without integrating any social purpose into the training. This training is the least adapted of the three, and invariably the east engaging and least effective curricular model in relation to employability.

These categories are a useful heuristic for illustrating differences in emphases among NGOs in developing and adapting training programs for their community learners. In practice, however, training programs do not exhibit the exclusive characteristics of only one approach. That is, while we coded each NGO based on its dominant characteristic, many of them have training programs that integrate components of the other approaches.

Closely related to the training approaches comes the issue of certification. Certification leverages the credibility of the

certifying authority, and produces benefits independent of the hard skills gained from the ICT training course. However, there are a variety of certifying authorities and not all garner the same level of legitimacy or recognition in the labor market. Along with who certifies the trainees comes the issue of what that certify measures: competences or participation and completion of a training program. Certificates of completion are very common for many NGO training programs and the organizations themselves are often the certifying authority together with the providers of the training materials if they are not developed by the NGOs. The value of the two types of certificates in the labor market really depends on the context. However, in some circumstances, a certificate of completion may not be as valuable as a certification of competencies (for example, International Computer Drivers License or ICDL) since it is difficult for trainees to show what they actually learned by "participating and completing" a training program. On the other hand, a certificate of completion from an organization with strong ties to employers can garner legitimacy and recognition if the employers are familiar with the ICT skills trainees developed during the training.

Other employment-related training | How they complement ICT skills with interpersonal skills training?

In addition to ICT skills, employers also emphasize the importance of other competencies that increasingly play a role in the hiring and promotion decisions in the workplace. Skills such as teamwork, collaboration, communication, etc., are among those abilities that employers seem to value [10]. Soft-skills or interpersonal skills are those: "'skills, abilities, and traits that pertain to personality, attitude, and behavior rather than to formal or technical knowledge' [26: 44]. NGOs are also becoming increasingly aware of the need to complement ICT skills training with soft skills training in order to increase the chances for their trainees to succeed in the workplace. These complementary interventions can have an important effect on employability outcomes since they allow the trainees to develop or further develop pivotal social skills. The interpersonal skills that organizations choose to emphasize in the training program depend on the target population and the approach to training. For example, an organization that targets young adults who are entering the labor market for the first time may choose to emphasize the importance of punctuality, team-work, and communication as relevant social skills for their beneficiaries. With the same rationale, an organization that provides industry-specific training for the tourist sector or for micro-entrepreneurs will probably include customer service training a central component of social skills development.

Level 2 | the nature and dynamics of the NGO's relationships with employers, donors, government agencies and other social organizations and the way that these networks impact employability outcomes;

A. Employment-related and other social services | What strategies they use to connect trainees to the labor market?

The skills trainees acquire during the program are critical for their personal development and performance in a job. However, those skills can be rendered meaningless if they the lack the knowledge on how and where to look for a job, prepare for an interview, or write a resume. Employment and social services play a key role in the employability equation and influence the motivations of trainees to participate, complete, and if successful, gain additional professional experience through internships or on-the-job training opportunities, and land in a job.

Three clusters of services are identified: 1) Job Preparedness (interviewing practice, resume writing, etc); Job Search and Placement services (job hunting, internship programs, etc); and Enabling services that provide trainees with social services indirectly related to work skills but can facilitate the participation in the program (transportation, childcare, clothing, etc.).

Embedding ICT training in a larger array of employment services can improve the effectiveness of training itself. The eat-your-vegetables approach to ICT that leads students through lessons simply because they will someday be good for them is less effective than applying ICT to concrete goals that trainees value. Resume writing, job search, budgeting for entrepreneurs, business plan writing and email with mentors or family members living abroad are examples of integrated ICT training that use ICT to teach other valuable skills in an engaging, applied manner [27].

Social services such as transportation, housing, and childcare address indirect, yet important, facets of employability, especially for workers seeking promotion or better jobs. In some cases access to a food bank or health care is essential.

Low-wage workers, for example, who want to add skills, attend training, or find employment farther from home need assistance beyond ICT.

B. The strength of ties and the diversity of NGO networks

The ecosystem of employment service organizations is diverse and collaborative. In highly diversified NGO networks we can find ties with employers, government agencies, donors, and other social organizations. For example, NGOs interviewed for this research reported that their beneficiaries receive services from a number of organizations and are cooperatively referred between these groups. Staff members describe close professional relationships with staff from other social organizations[7]. Government agencies also play important roles in the networks of service providers. Employer partnerships vary widely, ranging from non-existent to relatively passive, symbolic advisory boards to active consultation and training around high-growth industries. Closer coordination with employers that are actively tracking and shaping the demand for labor in their locality seems promising. Developing strong relationships and coordinating programming across organizations allow service providers to refer beneficiaries elsewhere depending on their particular needs. While there are clear advantages to providing many services under one roof, distributing services across the network can promote efficiency through specialization. Each actor in the network has strengths that can be leveraged.

The network as a form of organization constitutes a rather different way to engender social arrangements and construct shared meanings and values. As Podolny & Page [28] argue, network forms of organization are characterized by enduring relationships and exchanges among a set of actors that are distinct in nature because there is no legitimate organizational authority that reinforces these relationships. Instead a network is created and maintained on the basis of trust, legitimacy, and ethical behavior making this form of organization different from markets and hierarchies. Networks are generally highly dynamic, decentralized, and susceptible to innovation. Flexibility makes this form of organization highly efficient and adaptable to different circumstances diminishing the threat to its balance and structure.

The strength of the ties among different actors of the NGO networks can be measured depending on the tangible and intangible resources that circulate in the network and the outcomes these resources help to advance. Using a research method such as social network analysis can help us understand the extent to which the strength or weakness of a tie between an NGO, and for example employers, affect employability outcomes for the beneficiaries. Similarly, it is possible to discern the role that each actor plays in the employability pathway.

Level 3 | Factors at the individual and macroeconomic level that affect employability outcomes

A. What motivates individuals to join ICT skills training programs?

The analysis so far has focused on the elements in the NGOs program design and their relationships with other relevant actors that affect employability outcomes. The discussion turns now to the factors at the individual level that shape the motivation of beneficiaries to come to the organizations, to enroll in the training program, and to some extent, to follow certain track in the employability pathway. The list below is intended to illustrate some of the personal motivations that bring people into the training programs and it's not intended to be comprehensive.

1. *People enroll in ICT skills training programs to build skills that improve employability to either*
   - Find a job, enter workforce, (Re)skilling)
   - Find a better job, promotion, or keep a current job that is demanding additional skills (Upskilling)
   - Start a business, improve income via the informal economy

[7] For examples of collaboration across NGOs see: UGABytes in Africa, Somos@Telecenters in Latin America, Telecentre-Europe, telecentre.org a network of networks.

2. *People enroll because ICT skills are perceived to be socially important symbols (and expressions) of participation in modern life.*
3. *The organization functions as a social hubs, and ICT training is a byproduct of other reasons for coming to the centers*
4. *Social recommendations draw people to ICT training*

- Children (who come for games or training) refer parents,
- Co-workers refer each other,
- Friends refer each other,
- Program directors or staff within the same NGO but not related to the ICT training that refer beneficiaries to technology programs.

B. What contextual factors affect the capacity of people to improve their employment opportunities?

Finally, there are factors outside the NGOs or individuals sphere of influence that are critical to understand the linkages between ICT skills training programs and employability. It is very complex to provide a comprehensive list of exogenous variables that impact employability outcomes. The contexts are so varied and affected by so many different factors that a simple list renders the exercise futile. Using an example from our research in Poland is a productive way to showcase some of the factors at the economic and political level that are impacting the employment opportunities for people with physical disabilities.

Case Study: The transformation of the Polish economy and their effect in employment opportunities for disabled people

The transformations in the Polish economy in the last twenty years are crucial to understand the role of ICT skills in the labor market: 1) The shrinking of the industrial and agricultural sectors in relation to GDP accompanied with a rapid growth of the services sector reaching 65% of the GDP in 2006*; 2) A decrease in the unemployment rate that started together with the accession to the EU (estimated at 14% compared to 20% in 2003). This decrease is also the result of a big migration of Polish qualified workers to other EU countries and 3) A swift of bargaining power from the employer to the employee.

For ICT training and employment programs targeting people with physical disabilities all these transformations are incredibly relevant. On the one hand, the increase in the service sector is generating generates an array of job positions that are highly suitable for people with physical disabilities since they don't require people to be physically present in an office (i.e. telework, web design, data bases programming, etc.). Qualified employees are in such in demand in this country that employers are almost forced to offer good salaries and benefits to attract valuable human resources to their companies and this includes people with or without disabilities. Even though there still exists in the business culture a pervasive prejudice against people with disabilities, the business environment is changing and with it the misperception of what a person with disability can achieve professionally. In addition, the government passed a law that protects people with disabilities against discrimination in the labor market and it is offering financial incentives, in the form of tax breaks, to those companies that design or redesign their offices to make them suitable and hire disabled people.

CONCLUSION

ICT skills are almost never the missing link that miraculously transforms employment prospects. Lower wage, lower skill workers typically face multiple barriers, many of which are more complex than unfamiliarity with email or word processing. ICT literacy cannot be isolated from larger social and personal contexts. Soft skills as well as solutions to challenges such as childcare, transportation, time, and appropriate attire are important. Homeless and immigrant populations operate under additional constraints. The hurdles are diverse and individualized and ICT must be integrated into this larger context of needs to credibly advance employability and economic opportunities for low-

income groups. Although the analytical framework was based on the elements present in NGOs ICT and employment programs, and thus is limited to these experiences, it can be used in modular ways to adapt it to programs offered by other providers. An important area left outside the framework is the quality of the jobs or economic opportunities that program beneficiaries obtain. Issues such as job security, opportunities for further training, and chances for upward mobility in the workplace to name a few, are critical to move the discussion beyond the binary option unemployed or employed.

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