

Research Article

Understanding the Links Between ICT Skills Training and Employability: An Analytical Framework

Maria Garrido

migarrid@uw.edu
Research Assistant Professor
Technology and Social
Change Group
University of Washington
The Information School
4311 11th Avenue NE
Suite 400
Seattle, WA 98105
USA
(206) 616-9101

Joe Sullivan

jcs23@uw.edu
Research Analyst
Technology and Social
Change Group
University of Washington
The Information School
4311 11th Avenue NE
Suite 400
Seattle, WA 98105
USA
(206) 616-9101

Andrew Gordon

acg@uw.edu
Professor Emeritus
Daniel J. Evans School of
Public Affairs
University of Washington
P.O. Box 353055
Seattle, WA 98195
USA

Abstract

This article proposes an analytical framework to better understand the role that information and communication technology (ICT) skills play in improving employment opportunities for low-income groups. It draws on research conducted with more than 70 nongovernmental organizations (NGOs) that provide ICT training and other employment services in 30 countries around the world. It explores the linkage between ICT skills and employability on three levels: (a) NGO program design, (b) characteristics of individual job seekers or trainees, and (c) environmental dynamics that influence employment outcomes. The researchers argue that basic ICT skills are often important, but are usually insufficient for members of disadvantaged groups to improve their employment situation. The proposed multilevel framework identifies some of the common elements that help situate basic ICT skills in relation to other factors that can facilitate or impede employability.

1. Introduction

The diffusion of information and communication technologies (ICTs) across all economic sectors is placing new demands on workers' skills. The changing skill set is both expanding employment opportunities and imposing new demands on disadvantaged groups. In today's job market, basic ICT skills are considered essential for people entering the workforce and for those trying to find a better job. Governments consider an ICT-skilled workforce a strategic asset that spurs economic growth, promotes competitiveness, and improves business productivity. A nation's economic well-being depends "on both the effective use of ICT for businesses and industrial processes and on the knowledge, competencies, and skills of current and new employees" (European Commission, 2004, p. 2).

ICT skills are not only required for jobs in the information technology (IT) sector. The demand for them cuts across sectors and job types. ICT skills are increasingly important in sectors such as agriculture, construction, education, and service industries. In many labor markets, particularly in more developed but also in less developed contexts, ICT-related occupations represent an important slice of economic activity (Lopez-Bassols, 2002; van Welsum & Vickery, 2005). A 2006 OECD study estimated that 20–30% of total national employment was ICT-related. ICT "specialists" (OECD, 2006, p. 216)¹ accounted for only 3–4% of ICT-related jobs.

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

“Basic and advanced” users held the remainder of ICT-related jobs (ibid, p. 216). This article examines the links between ICT and employability among the latter group—basic and advanced users who are not ICT specialists.

Understanding these links is relevant to the study of ICT and development (ICTD). Most of the ICTD literature that addresses ICT skills in the context of employment focuses on the IT sector—for example, the software industry—and the economic opportunities available through business process outsourcing, such as in India (Hong, forthcoming; Schware, 2009; Vigneswara, 2007). A few studies have looked beyond the IT sector (Donner, 2004; Galperin & Bar, 2007), but more research is needed, especially on basic computer skills for basic and intermediate users (as opposed to specialists). In this space, NGOs are important but underresearched intermediaries that provide training, services, and connections to labor markets for disadvantaged populations worldwide (Chapple, 2005, 2006; Mariscal, Botelho, & Gutierrez, 2009; Sullivan, Gordon, & Vander Leest, 2008; West & Garrido, 2007). This research is intended to help fill these gaps.

This article proposes an analytical framework to better understand basic ICT skills training in the context of increased employment and economic opportunities. The framework builds on our research conducted with more than 70 NGOs that provide ICT training and other employment services primarily in disadvantaged settings in Asia,² Latin America,³ Europe,⁴ and the United States.⁵ Typically, these NGOs operate computer laboratories in public spaces; they are often referred to as telecenters or community technology centers (CTCs). The framework incorporates three levels of analysis: (a) NGO program design, (b) characteristics of individual job seekers or trainees, and (c) environmental dynamics that influence employment outcomes.

The article focuses on NGOs because their role in workforce development is critical and often underappreciated. NGOs are increasingly important intermediaries that enhance labor market information, skills, and social connections for disadvantaged groups (Chapple, 2005, 2006). Often they represent

one of the only resources for these groups to improve their job prospects. NGO programs are diverse in kind and scope, reflecting the needs of their target populations. They employ a wide range of approaches to establish relationships with employers, government agencies, and donors. Their missions and overall organizational capacity also vary widely.

NGOs are uniquely positioned to provide training and job-seeking assistance to people who face higher barriers to employment. As Chapple (2005, 2006) argues, “[N]ot-for-profit organizations that have the ability to connect [unemployed workers] to local industry and teach the skills and language of the ‘switched on’ are the most effective in helping disadvantaged groups enter the labor market” (2006, p. 549). These organizations offer access to training programs that are free or affordable in an environment that promotes lifelong learning, as well as being generally able to adjust more easily to diverse groups and learning styles.

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 work, which is, in most cases, not ICT. User skills cover generic software tools and specialized tools supporting business functions within industries [in addition] to the ICT industry. (European Commission, 2004, p. 5)

Most of the organizations that provide training characterize their work as “basic computer training,” which typically includes introductory instruction on operating systems, productivity applications (word processing and spreadsheets), e-mail, and the Internet.

2. ICT Skills Training and Employability: Theoretical Foundations

2.1 *The Importance of ICT Skills Training*

The changing skill demands in today’s knowledge economy have been the subject of thorough policy and academic discussions. The diffusion of ICTs

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

3. Brazil, Colombia, Ecuador, Guatemala, Mexico, and Venezuela.

4. Austria, Bulgaria, Czech Republic, Denmark, Estonia, Finland, Hungary, Ireland, Italy, Latvia, Poland, Romania, Russia, Spain, the Netherlands, and Turkey.

5. Regions in the United States: Austin; Boston; Chicago; New Orleans; New York; Portland, OR; Seattle; Tacoma, WA; and the state of Virginia.

across industrial sectors, along with changing business models, has induced “skill-biased organizational and technological change” (de Grip & Zwick, 2005; Green, 2009; Machin, 2001). Workers in a wide variety of fields have had to adapt and incorporate ICT into their jobs (Green, 2009; Machin, 2001). These changes increase the complexity of skills required by today’s workforce and threaten the position of low-skilled workers “when they do not succeed in adjusting their skills according to the shifts in the skills demanded in their job or sector of industry” (de Grip & Zwick, 2005, p. 6).

In addition to ICT competence, other skills are often required in today’s labor market, including communication skills, teamwork, collaboration, critical thinking, decision making, and general social skills (Chapple, 2006; Green, 2001; Stasz, 2001). In this environment, low-skilled, long-term unemployed and older workers are more vulnerable to skill obsolescence than are other groups. Moreover, during economic downturns these workers must compete with higher-skilled workers who are suddenly willing to take lower-paid jobs. Lower-skilled workers risk being “crowded out” (de Grip & Zwick, 2005, p. 1) of the labor market or trapped in dead-end and low-wage jobs.

Other relevant literature on the relationship between ICT skills and employability focuses on the effect of computer skills on compensation and opportunities for upward mobility (Doms, Dunne, & Troske, 1997; Fan, Dey, & Peng, 2006; Green, Felstead, Gillie, & Zhou, 2007; Riley, 2007). Green et al. argue (2007) that the effect of ICT skills on productivity and wage differentials is greater for employees who 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” (p. 67). In their analysis, computer skills have a significant impact on pay (5.3% and 6% for men and women, respectively), but this effect depends on what the authors define as “influence skills” (ibid.).

Benefits of ICT skills training are not limited to improved computer skills. Training often draws users into an environment where they develop nontechnical workplace skills (Sullivan et al., 2008). Computer skills can also catalyze self-directed learning and participation with extended social networks (à la “the strength of weak ties”) that promote employability (Granovetter, 1973).

2.2 Employability as a Conceptual Frame for Development

Employment is an important outcome in the context of basic computer training because it represents a concrete contribution to economic well-being and quality of life. Employment can provide predictable income and is sometimes accompanied by other benefits associated with work in the formal economy such as social security, health insurance, and legal protections. Many NGOs work hard to encourage the development both of employers and employees in their neighborhoods. This dual focus is important for healthy, sustainable labor markets and improved livelihoods.

In many communities where unemployment is high and informal economic activity dominates, employment outcomes are difficult to achieve. Even under ideal circumstances—where individuals possess a variety of personal assets and NGOs provide high-quality employment services—clients may still not find jobs. As a measure of organizational efficacy, employment per se can be an insufficient metric because it relies on labor market variables over which service providers have little or no control. A different conceptual approach is required that recognizes that interventions may improve employment prospects, even when employment is not achieved. Enter *Employability*.

Employability is commonly defined as the combination of factors and processes that enable people to progress toward or find employment, to remain employed, and/or to advance in the workplace (Brown, Hesketh, & Williams, 2003; Fugate, Kinicki, & Ashforth, 2004; Houston, 2005). As persons enhance their skills, develop experience, and become more competitive job applicants, their employability improves. Even if their position in the labor market never changes, their employability may have been enhanced.

The concept of employability emphasizes an individual’s skills and skill development (Brown et al., 2003; Fugate et al., 2004; Houston, 2005). The popularity of this concept has grown as global business has moved away from a workforce based on long-term tenure in favor of shorter-term, transitory arrangements. Workers today average only a few years at a job in contrast to past generations who may have spent entire careers with one company (Sullivan, Carden, & Martin, 1998; Waterman, 1994). Employability represents a conceptual and policy shift away from collective workforce

approaches, such as full employment, and toward individual employee assets (Berntson, Sverke, & Marklund, 2003).

For the highly skilled workers for whom employers compete, employability tends to be a useful framework; additional skills (when a prospective employee is already desirable) sweeten the pot. For these workers, whose skills are not seen as easily substitutable or interchangeable, having additional skills prized by employers increases bargaining power and economic gain (de Grip & Zwick, 2005). Against the backdrop of a globally interconnected knowledge economy, with technology skills and processes at the heart of economic transactions, ICT training is closely connected to employability.

But among lower-skilled workers, the marginal benefit to employability from additional skills may be muted. While it is generally recognized that upgraded skills are required to participate in the job market (Brown et al., 2003; Green, Ashton, & Felstead, 2001; Stasz, 2001; West & Garrido, 2007), demand for particular skills depends on the employer. Thus, day laborers with computer training are only more employable if a potential employer values those skills. The employer must also desire the whole package—computer skills plus all the other attributes of the prospective employee. Further, while it might be decisive if one person in a community possesses rudimentary computer skills, if most job competitors possess those skills, their marginal value diminishes, and hiring decisions may turn on other criteria. The question of employer demand is often omitted from employability discussions: The skills that employers demand and their distribution among the pool of applicants are essential pieces of the puzzle (Brown et al., 2003).

3. Our Approach

The Technology and Social Change (TASCHA) Group (formerly the Center for Information & Society) at the University of Washington has pursued a research agenda investigating the relationship between basic ICT skills training and employability for the last four years. The work began as a series of program evaluations for Microsoft Community Affairs to assess the impact of its global Community Technology Skills Program (CTSP).⁶ Over time, the work shifted from

program evaluation, which was largely an internal consultative effort, toward public-facing research that considered not only Microsoft grantees but also other organizations providing ICT training to promote employability. The research grant from Microsoft offered resources for drawing comparisons across a wide range of organizations and settings. It also provided access to organizations throughout the world that are leaders in their fields.

Table 1 outlines 10 TASCHA studies over the last three years that examine ICT training and employability. These studies represent organizations in 30 countries that use a wide variety of service models and that target diverse populations.

These studies comprise the body of evidence that we used to build the framework for this article. The particular methodologies and findings of each study are too unwieldy to delineate in this article. Our goal instead is to describe the evolutionary nature of our research agenda to ground the framework that is to be presented (Garrido, Badshah, & Coward, 2009).

3.1 Logic of Inquiry

Our program evaluation work with Microsoft has created a foundation of premises related to critical success factors. The structure of the CTSP grant gave us access to a large number of training organizations that were both similar and different in important ways in terms of mission, geography, operating environment, target population, community networks, and so forth. There was evidence of successful ICT skills training for employability, yet it was incredibly varied. Our approach drew on the logic of quasi-experiments and on attribution theory to make sense of the large body of evidence (Gordon & Sullivan, 2009).

Quasi-experimentation, a research strategy advocated by Donald Campbell (1969) and others, aspires to rigor despite the complexity and diversity of “real world” settings. While we faced a research environment where the “most successful” programs seemed to be highly adapted to their particular circumstances (assets, constraints, needs of client populations, operating environment, etc.) for many reasons (such as the current and shifting interests of donors and partners), we were unable to randomly select ICT training programs. Quasi-experimentation guided our inquiry into how variables with varying

6. <http://www.microsoft.com/southafrica/communityaffairs/default.aspx>

Table 1. TASCHA Studies on ICT Skills & Employability.

TASCHA ICT & Employability Study	Year	Countries	No. of NGOs sampled	Target Population
ICT training for disadvantaged populations: The importance of tailoring to the local context	2007	Australia, India, Taiwan, Vietnam, Sri Lanka, Brazil, Colombia, Guatemala, Mexico, Austria, Finland, Denmark, Russia, USA	25	NGO administrators, technology trainers, trainees
ICT training & employability: Integrated service delivery in workforce development networks	2007	USA	15	NGO administrators, technology trainers, non-technology service providers
Evidence Narratives: Assessing the effects of NGO ICT skills training through story-telling	2008	India, Sri Lanka, Philippines, Austria, Bulgaria, Romania, Poland, Slovenia, Czech Republic, Ireland, Mexico, USA, Turkey	22	Women, youth, farmers, miners, teachers, people with disabilities, domestic workers, rural & urban populations
Bridging the e-skills gap in Central & Eastern Europe: The growth of e-Skills & employability initiatives in the newly expanded European Union	2008	Bulgaria, Czech Republic, Latvia, Romania, & Poland	7	Women, people with physical disabilities, unemployed workers
Information & communication technology (ICTs) training, employment & youth: The case of Brazil, Colombia, & Mexico	2008	Brazil, Colombia, & Mexico	11	Youth
Work & play in the information age: Technology utilization in Boys & Girls Clubs of America	2008	USA (Washington, New York, Massachusetts, & Oregon)	38 Clubs	Youth
Technology for employability in Washington state: The role of ICT training on the employment, compensation, & aspirations of low-skilled, older, & unemployed workers	2009	USA (Washington State)	17	Low-skilled workers, older, unemployed workers
Technology for employability in Latin America: Research with at-risk youth & people with physical disabilities	2009	Brazil, Ecuador, Mexico, Guatemala, & Venezuela	25	People with physical disabilities, youth
Immigrant women, e-skills & employability in Europe: The case of Hungary, Italy, the Netherlands, Spain, & Romania	2010	Hungary, Italy, Spain, the Netherlands, & Romania	32	Immigrant women, NGO administrators, technology trainers
ICT training & jobs in Colombia	2011	Colombia	8	NGO administrators, trainers, trainees, youth, people with physical disabilities

levels of importance in different settings could contribute to a coherent body of evidence. Thus, in Campbell's words:

The advocated strategy, quasi-experimentation, is not to throw up one's hands and refuse to use the evidence because of lack of control, but rather to generate by informed criticism appropriate to this specific setting as many plausible rival hypotheses as possible, and then to do supplementary research . . . which would reflect on these rival hypotheses. (pp. 409–429)

Through iteration, we developed and refined our ideas, building on knowledge gained in earlier work to shape the research questions and sampling strategies in later studies.

The logic of attribution theory, frequently associated with Harold Kelley and the earlier work of Fritz Heider, provided guidance for the critical "winnowing of ideas" that characterizes quasi-experiments and scientific inquiry generally (Campbell & Overman, 1988). Attribution theory describes an approach that uses numerous examples across settings and actors and then varies them intentionally to understand the typicality (or atypicality) of a phenomenon. We borrowed from this logic to choose, analyze, and design research to maximize the amount of relevant data. We were informed particularly by key dimensions—consistency, consensus, and distinctiveness (Gordon & Sullivan, 2008)—initially identified by Kelley:

3.2 Implications for the Framework

The logic just described represents the basis for our analytical work on the framework presented in the next section, not simply our research design architecture. By carefully considering the key themes that emerged (or did not emerge) across settings, by developing rival explanations for their presence, and by attempting to account for the variation in those findings, we increased our confidence in the following general findings regarding ICT training and employability.

4. The Proposal: An Analytical Framework to Understand the Links Between ICT Skills Training and Employability

ICT skills are key components of employability programs throughout the world. For analytic and programmatic purposes, it is important to recognize the

many ways that basic ICT skills training is delivered and the multitude of factors that interact with training to influence the desired employability outcomes, especially for disadvantaged populations. The following framework identifies personal, organizational, and environmental factors that have consistently emerged in our work as relevant for understanding the relationship between basic ICT skills training and employability. While there is a great desire to define the relationship between the ICT skills training that is provided by NGOs and employability outcomes, unfortunately, the parameters of that relationship depend on other factors and variables. The following framework (summarized in Table 2) provides an overview of key variables we have identified. Short explanations of the categories follow.

4.1 NGO Factors

NGOs play a key role as advocates for disadvantaged groups and as labor market intermediaries in that they provide basic ICT skills training and other services. We agree with others (Chapple, 2005, 2006) that because of their approach, particularly to disadvantaged populations, NGOs are often regarded as more effective than private training providers and sometimes government.

4.1.1 Organizational Characteristics

1. Mission. Vision. Scope. While the primary interest of this research is employability—and by extension socioeconomic development—the organizations sampled are driven by very different visions. Their individual missions exert an important influence on programs and outcomes. Organizations that may emphasize employability in their mission statement or in a grant application often have a different emphasis on the ground. The ways in which employability is operationalized in the actual programs and services that organizations offer are multiple in kind and nature, ranging from providing ICT training with access to online or offline job listings to offering comprehensive programs that also include certification, internships, and access to social services such as transportation and child care, to name a few. Other dimensions of the organization's scope that affect employability outcomes include the geography, the target population, and the availability of jobs.

2. Values. In a number of organizations there is fierce adherence to the values of discipline, hard

work, and community. These values permeate the programs and services and are evident among the staff and students.

3. Partnerships. Many NGOs have well-established relationships with the communities they serve. Often they provide an important social hub where people can learn and develop a variety of social skills well beyond their announced goals. Because of the trust they have engendered in disadvantaged populations, these NGOs are often important intermediaries for “external” services and relationships. Our research identified a wide range of creative and “mission critical” partnerships with employers, government agencies, other NGOs, and donors that affect employability outcomes.

4.1.2 Program Characteristics

Variations in program design are important for understanding the employment outcomes that can be expected from basic ICT training.

1. Client selection. Organizations select clients based on different criteria. Programs that “take all comers” have different inputs and outcomes than do programs that select the “cream of the crop,” or that have other strict barriers to entry, such as an emphasis on specific target populations.

2. Client employability expectations. In programs where participants have a laser-like focus on “getting a job,” the complementary inputs and outcomes differ from those of participants who are enrolled in training programs for reasons other than finding employment. Sometimes, the same program may serve active job seekers, as well as trainees without an immediate need to find a job. A variety of program types emerged from our research. Among them, re-skilling, up-skilling, and entrepreneurial programs are designed for particular types of “workers.”

3. ICT training strategies. Some programs approach training horizontally, integrating ICT training into broader job-training curricula where, for example, carpenters, plumbers, or electricians learn a little about computers. Vertical training describes more specialized technical expertise, for example, training technical support staff. Organizations take a variety of approaches to curriculum and materials development. Some use off-the-shelf resources, such as the Microsoft UP curriculum, others create their own materials, and many modify

existing materials. Certification strategies (*what* and *who* are being certified) have important implications for the perception of employers and of graduates themselves.

4. Complementary services. ICT competencies are often thought of as the “magic bullet” for employment; our experience is that this is never the case. It always is one element among a set of inputs that seems to make a difference. The combination of complementary services varies, based on the needs of the client population and the relative availability of other services. Elements that are evident in many highly regarded settings include placement services, connections to employers, and a range of social services.

Our sense is that the most successful organizations (in terms of employment outcomes) tend to have complex and developed systems in these areas.

4.2 Personal Factors

The personal assets, experiences, histories, and so forth of the people who are actually looking for work have a profound impact on their eventual employability (all else being equal). Because the emphasis of this research has been on training programs, we explored personal issues to the degree that they were relevant to organizational program design choices. For example, many organizations employ counselors and work with populations facing substantial psychological trauma, such as human trafficking survivors, internally displaced peoples, and those with disabilities. Two sets of personal factors stood out:

1. Sense of Self. Self-image and psychological issues play an important role in one’s workplace readiness. Even after interventions, employers and service providers describe many trainees, regardless of their ICT skill levels, as “not ready to work” due to emotional and other psychological issues, as well as to issues relating to confidence.

2. Workplace Readiness. Employers typically expect some level of computer literacy, often some formal education, and the ability to learn new things. Employers also prefer to see some work experience to show that an individual can operate in that environment. Our research also highlighted the importance of a person’s social networks for finding and keeping work and, conversely, the trouble that can arise when these networks are unavailable.

UNDERSTANDING THE LINKS BETWEEN ICT SKILLS TRAINING AND EMPLOYABILITY

Table 2. ICT Skills Training & Employability Framework.

	Category	Subcategory	Variables
NGO Factors	Organizational Characteristics	Mission, vision, scope	<ul style="list-style-type: none"> • Social mission • Centrality of ICT skills training • Centrality of employability • Geographical reach (local, regional, national, international) • Target populations (general, women, youth, people with physical disabilities, seniors, etc.)
		Values	<ul style="list-style-type: none"> • Discipline Motivation Community
		Partnerships	<ul style="list-style-type: none"> • Clients Employers Government Other NGOs Within an NGO, but across units Donors
	Program Characteristics	Client selection	<ul style="list-style-type: none"> • Take all comers Targeted population Cream of the crop
		Client employability expectations	<ul style="list-style-type: none"> • Find a job, enter workforce (re-skilling) • Find a better paying job, promotion, or keep a current job that demands additional skills • Start a business, improve income via the informal economy • No expectation of employability
		ICT training strategies	<ul style="list-style-type: none"> • Vertical training (IT workers) • Horizontal training (basic ICT skills for cooks, carpenters, etc.) • ICT curriculum, training materials • Train the trainers • Certification (skills, participation)
		Complementary services	<ul style="list-style-type: none"> • Job preparation (interview skills, communication skills, CV preparation, etc.) • Job placement services (job search, job hunting strategies, etc.) • Connection to employers (job matching, internships, job fairs, recommendations, etc.) • Social services (legal, psychological, health care, transportation, etc.)
Personal Factors		Sense of self	<ul style="list-style-type: none"> • Self-esteem, self-confidence Motivation for engaging organization • Emotional well-being
		Workplace readiness	<ul style="list-style-type: none"> • Work experience • Literacy (language, numeracy, social) • Formal education • Informal learning access (lifelong learning)
		Extended networks	<ul style="list-style-type: none"> • Home/family roles • Extent, diversity of social networks • Civic engagement
Environmental Factors	Labor Market Dynamics	Job supply and demand	<ul style="list-style-type: none"> • Available jobs Industries/sectors Bust versus boomtown • Social barriers to hiring (discrimination based on age, gender, nationality, physical condition)

Table 2. (Continued)

Environmental Factors (continued)	Job quality	<ul style="list-style-type: none"> • Full time / part time / temporary • Job quality • Opportunity for upward mobility • Benefits (social security, legal protection, training, etc.)
	Required job skills	<ul style="list-style-type: none"> • Communication, teamwork, people skills, etc. • ICT skills • Critical thinking • Work habits (arrive on time, work ethic, etc.) • Ability to learn on the job, retraining, etc.
	Public Policy Subsidies, public support	<ul style="list-style-type: none"> • Job training, employment programs • ICT access infrastructure (public libraries, Internet) • Transportation • Housing
	Legal protection	<ul style="list-style-type: none"> • Workplace • Immigration • Gender • People with disabilities • Work-life balance • Crisis recovery
Social Dynamics		<ul style="list-style-type: none"> • Discrimination • Social norms

4.3 Environmental Factors

By environmental factors, we refer to social and community dimensions beyond the personal and organizational issues described previously. For those interested in employment outcomes, the policy environment, labor market, and related social dynamics should be taken into account.

1. Labor Market Dynamics. The supply of jobs and the demand for the skills that an applicant brings to the table are essential. We have seen a number of ICT training programs that are closely tailored to the local labor conditions and some that operate as if in a vacuum. Labor market considerations are essential to understanding employability outcomes. This is one of the reasons complementary services (headlining a previous section) are so important.

2. Public Policy Environment. The legal environment provides both opportunities and constraints

with respect to employability—for example, in the material support that government may or may not provide for those seeking employment and through laws and policies that reduce barriers to employment, such as protection from discrimination.

3. Social Dynamics. Social norms (e.g., the relative importance of cohesive family units or of women's empowerment) may differ substantially from setting to setting, with important impacts on modes of training, access to services, and ancillary benefits and opportunities.

5. Applying the Employability Framework: Case Study on Immigrant Women in the European Labor Market⁷

The following case study (Garrido, Rissola, Rastrelli, Diaz, & Ruiz, 2010), which is represented in Table 1, is based on the experience of immigrant women in

7. This case study is based on a previous TASCHA publication: *Immigrant Women, e-Skills and Employability in Europe: The Case of Hungary, Italy, the Netherlands, Romania, and Spain* by M. Garrido et al., (2010). For the full report, see <http://tascha.uw.edu/employability/>

Table 3. Distribution of the Sample per Country.

Country	# of Immigrant-born women	# of NGOs per country
Italy	136	4
Spain	130	14
Hungary	40	9
The Netherlands	69	3
Total	375	30

four European Union (EU) countries: Hungary, Italy, Spain, and the Netherlands. It illustrates the application of this research approach and how some of the elements of the framework already outlined play out in a specific context. The case study examines the trajectory of 375 immigrant women who received ICT skills training and/or other employability support services in these EU destination countries. It provides insights into the employability challenges facing immigrant women, the role of NGO training and services, and how public policies affect the employability of immigrant women in the EU.

5.1 Background

In the last decade, women have been migrating in increasing numbers—and with greater impact on their families, countries of origin, and host societies—for the purpose of finding work. Women now account for more than 50% of the immigrant population in most European Union countries. It is widely recognized that this population confronts a “double disadvantage” in the labor market: difficulties in social and cultural integration as foreign-born workers, as well as gender bias with implications not only in the workplace but also in their domestic and family lives (Rubin et al., 2008). Migrant women face greater difficulties integrating into the labor market than do either native-born women or migrant men.

5.2 Methodology

In collaboration with 32 NGOs that serve immigrant women in four European Union countries (Spain, Italy, Hungary, and the Netherlands), we surveyed 375 immigrant women between May and August 2009. (See Table 3 for the distribution of the sample per country.) The immigrant women were selected using convenience sampling; for this reason, it is

difficult to assess how representative these women are of the population that benefits from the NGO programs. With the agreement of the organizations, participants were offered nominal compensation for taking part in the survey: one hour of paid time at the official minimum wage in each of the four countries. The survey⁸ was translated into six languages and implemented at the organizations using individual and group interviews. In addition, we interviewed 40 NGO representatives.

The survey included questions to investigate the women’s employment experiences, family dynamics, and aspirations for improving their job opportunities in the EU. Additionally, we included two open-ended questions to capture the main problems women face when first migrating to the EU and the issues they consider critical for advancing the position of women in the region.

Their premigration employment history was coded according to the International Labor Organization’s International Standard Classification of Occupations (ISCO-88).⁹

The four EU countries represented in the research were selected in part to reflect the difference in migration dynamics between “old” destination countries (the Netherlands) and “new” receivers of migration (Spain, Italy, and in recent years, Hungary). The diversity of contexts also illustrates the differences in the political environment, the host society’s attitude toward migration, and other environmental factors that influence deeply the economic and social integration of immigrant women in these host societies.

5.3 Brief Profile of the Sample Population

The immigrant women sampled come from diverse backgrounds in terms of nationality, family structure, languages spoken, and education level. These

8. The survey is available at <http://tascha.uw.edu/employability>

9. See <http://www.ilo.org/public/english/bureau/stat/isco/index.htm>

women represent 64 countries from different regions of the world. Half came from six countries: Morocco, Romania, Ecuador, Nigeria, Peru, and Ukraine. Respondents migrated primarily from Africa (42%) and the Americas (24%); smaller numbers come from non-EU Europe (12%), Asia (11%), and EU member states (11%).

In addition to their mother tongue, 89% of the women reported speaking more than one language. The most common second and third languages are Italian (41%), English (36%), French (21%), Dutch (20%), and Spanish (18%).

Most of the women are of working age, which is consistent with their most common motivation to migrate—to find a better job to provide for themselves and their families. The average age of the surveyed women is 36, with some variation across countries. At the time of the survey, 44% of the immigrant women were employed, and another 43% were looking for a job. The majority of the unemployed women lived in Spain and Hungary (66% and 58%, respectively). An additional 14% reported they were unemployed, but were not currently looking for a job; the majority of this group lives in the Netherlands.

5.4 Applying the Employability Framework: Case Study Findings

In this section, we apply the ICT Training and Employability Framework presented in the previous section to analyze the contribution of ICT training to the employability of immigrant women in the EU. Due to space constraints, we elaborate on only a few of the analytical elements incorporated in the framework.

5.4.1 NGO Factors

1. Diversity of Social Missions and Target Groups.

The study centered on 32 highly diverse NGOs, varying in size, social mission, and the range of services they offer. Generally speaking, all the organizations are active in social inclusion, e-inclusion, and educational issues; however, the centrality of ICT training and even employability goals within the social mission varies from organization to organization.

For the NGOs selected for the study in the Netherlands, for example, ICT training and language competencies represent the core services they provide for their beneficiaries and the building blocks of their social mission. The NGOs sampled in Spain, on

the other hand, are more diverse in terms of their social mission. ICT training, although an important component of their program, represents only one of many services available for immigrant women and other constituents. Some organizations in Spain focus primarily on educational, social, or cultural integration and have very diverse target groups. Others focus primarily on immigrant issues. All have been identified as playing an important role in assisting immigrant women with a range of services.

2. ICT Skills Training Strategies. ICT skills courses offered by the participating NGOs cover a wide range. All offer training in basic computer use (computer fundamentals, Internet browsing, e-mail, chat, etc.). Less than 15% of the organizations also cover advanced applications, such as e-administration, social networking, web design, and multimedia production. The organizations combine different ICT training strategies that include face-to-face and in-class training, peer-to-peer learning, and open access to the computer labs for immigrant women to practice their skills. Some of the organizations use ICT training as a tool to advance language skills.

3. Promoting Human Capital. The analysis strongly suggests that training matters: The comparison group of immigrant women who were NGO clients but had not participated in any ICT skills training reported lower ICT skill levels than did their counterparts who had received training (see Figure 1), with salient differences among countries. In Italy, most immigrant women have not received e-skills training (109 out of 136) and this sample also shows the lowest ICT skill levels of the four countries. In Hungary, respondents who had not received training in the surveyed organization, but who reported higher skill levels than those in Italy had often acquired advanced digital competence on their own.

Of the women who have not received ICT skills training, many report having no computer skills: 30% in Hungary, 44% in Spain, and 48% in Italy. (The Netherlands is not included, since almost all respondents have taken such courses.) The rest have some computer skills, including some with advanced skills: 9% in Spain, 17% in Italy, and 21% in Hungary. Internet skill levels are somewhat better. Those with no ICT skills make up 39% of this subgroup in Italy and 18% in Spain, but only 8% in Hungary; those with basic skills account for 20% in Italy, 46% in Spain, and 41% in Hungary. And notable per-

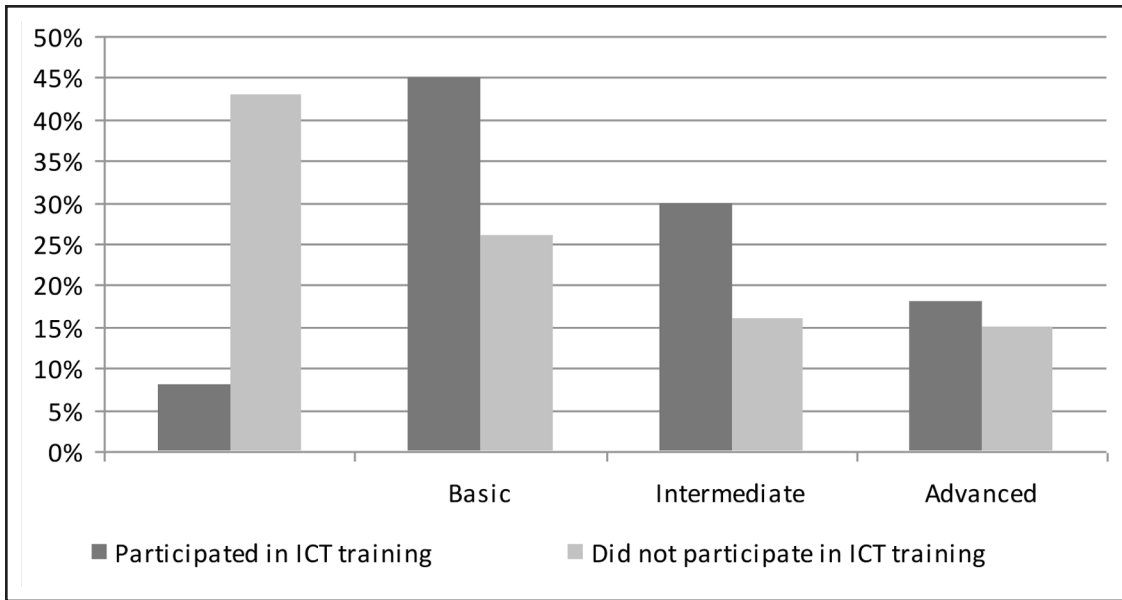


Figure 1. Comparison of computer skill levels, by participation of immigrant women in NGO ICT training. Note: Computer skill levels according to EUROSTAT indicators.

centages have advanced skills: 15% in Spain, 18% in Italy, and 31% in Hungary.

Repeatedly, our analyses of the contribution of ICT training for immigrant women showed the need to look beyond tangible improvements in skill levels. Other indirect benefits, while harder to measure, were reported to add value to their lives. One example is the range of activities in which participants engage when using computers and the Internet. Communication is the predominant use, including e-mail (76%), chat and VoIP (44%). Immigrant women who participated in the training use technology to communicate with relatives and friends abroad, to exchange photos, and to interact with their parents or kids using webcam. Another popular use is for job searching (50%).

4. Complementary Services. Immigrant women were asked where they learned how to use computers: The responses most often cited were “Self-taught” (46%) and “at an NGO” (44%). The cost (private facilities) and admissions requirements (e.g., schools, upper secondary institutions, universities) or other options made them less accessible. NGOs have other advantages as well: As they increasingly offer a range of nonformal training courses, for example,

they become an important adult training and life-long learning channel.

The three sites where immigrant women use computers and Internet most frequently are home (51%), NGOs (40%), and the homes of family or friends (24%). Respondents offered several reasons for the lack of Internet access at home: They emphasized that cost (unaffordable for immigrant women who are often unemployed or underemployed) and the instability of housing (especially for those most newly arrived) inhibits “luxury” purchases, such as Internet access. NGOs not only provide ICT training but also the opportunity for women to practice their skills and use computers and the Internet free of charge.

5.4.2 Personal Factors

There is a wide variety of personal factors that affect an individual’s ability to better their employability. Self-esteem, motivation for improving one’s skill set, family structure, and work readiness are among the most influential. For this analysis, we looked at the reasons for migrating as a proxy to understand the motivation to upgrade skills and participate in NGO training.

1. Personal Motivation. Most of the immigrant women sampled in the study are fairly recent

migrants with half migrating in the last 6 to 10 years and over a third in the last 5 years. The top two reasons for migrating were for work (52%) and for family reunification (32%). It would be logical to assume that women who migrated to find employment would have a greater incentive to enhance their previous educational background to better position themselves in the EU labor market.

Irrespective of their reasons for migrating, the immigrant women in our sample show a high level of participation in different training courses, including ICT. Less than one-sixth of the sample (58 women) reported no participation in training courses, while 58% participated in one to two courses and one-quarter had taken three or more since arriving in Europe.

When we factor in their reason for migration, we find that 50% of the women who migrated primarily for economic or employment reasons have taken one to two courses since they arrived in the host country, compared to 30% of women who migrated for family reunification. The reasons for migrating do not seem to predict their participation in ICT skills training. Some 44% of women who migrated to work participated in ICT training, compared to 41% of women who migrated for family reunification, bolstering the importance to this population of information technology for communications purposes.

5.4.3 Environmental Factors

1. EU Labor Market Dynamics. The immigrant women who were employed at the time of the survey were overwhelmingly at the base of the employment pyramid (cleaning services, caregivers, waiters), even if they were qualified for better jobs. Those who worked as professionals in their countries of origin also held a professional position in the host country. This was not the case, however, for those holding technical and associate professional positions in their countries of origin. In many EU countries, the overqualification rates for female migrants are significantly higher than they are for native-born women. Furthermore, these rates appeared to be more pronounced in Southern European countries and more acute among immigrant women from non-EU countries (Rubin et al., 2008).

Against this labor market environment, one is almost forced to question if ICT skills do indeed better position immigrant women to advance in

their employment path, especially when these skills are not really required for the types of jobs they often perform. For immigrant women, the benefit from having additional skills—ICT and others—is perhaps marginal in a labor environment where they are clustered into a service sector market that does not require these skills to do the job.

2. Educational Credentials. Overall, the educational background of our respondents represents a valuable resource for the local labor market—a resource that is far from fully utilized. Almost one-third of our population of migrant women has gone beyond secondary education: 15% have vocational training diplomas and 17% have university degrees. Almost another third (28%) have high school diplomas. These immigrant women, as do others across Europe, struggle with the long and costly process of validation and recognition of their studies. Only 3% report that their study certifications were recognized, even after several years. In addition, inflexible work permits often prevent them from working and studying at the same time. Not surprisingly, their employment is only weakly related to their field of study: More than half report little or no relationship.

6. Conclusion

Developing ICT skills, especially in combination with the training experience itself, can advance immigrant women's employability in several ways. In addition to developing basic digital competence, the training helps expand and reinforce their social networks while imparting confidence in their ability to continue to learn. ICT training can also help overcome language barriers, a significant factor in finding employment. The process of language acquisition can be facilitated through ICT in various ways, including e-learning as well as the nonformal learning that occurs in digital literacy courses.

The survey asked the women to identify problems they face and to suggest policy improvements. Problems cited by respondents include language learning, employment issues, social marginalization, and bureaucratic procedures. The suggestions they offered tend to focus on social inclusion and on the quality of public and nonprofit services and employment centers.

More efficient public services tailored to meet the specific needs of immigrant women can maximize their potential contribution and the opportunities to

express their roles of social and economic agent. In addition, targeted awareness-raising campaigns could do much to promote the opportunities that technology offers for self-employment, entrepreneurship, and commercial initiatives. Related initiatives could emphasize the importance of lifelong learning and could open channels for dialogue with public agencies.

Survey responses indicate that NGOs serve a crucial function for immigrant women in that they ease both social and labor market integration. Overall, 88% of respondents participate in activities organized by the participating NGOs, with the immigrant women making more use of NGO services than do other groups served by these organizations. Networks for friends and families and for NGOs are the two most important networks through which immigrant women find channels to secure employment, to improve their ICT skills, and to access and use ICTs. NGOs play a pivotal role in promoting social, economic, and cultural integration and in advancing many of the competences identified by the EU as critical to success in today's labor market. Participation in NGO training often serves as the "springboard" for learning social and civic skills. NGOs also serve as a channel for finding employment, either by employing women directly or by facilitating employment through a network of links.

An important element of NGO services is providing ICT training, as well as free or low-cost access to a PC and the Internet. NGO training programs use interactive, informal teaching methods, presenting ICT in concrete ways by applying the new skills to practical tasks. NGO ICT training could become still more valuable if their programs could provide some form of official certification.

Viewing these data on immigrant women in Europe through the lens of the analytic perspective we described allows us to both build on earlier related work (helping us to formulate questions of general significance) and to provide a vehicle for sharpening the questions that need to be asked in the analyses of additional data sets and future studies. We expect that additional contributions to the literature on basic ICT training and to the roles that ICTs presently play in this space (and can play more effectively in the future) will be possible by building on this work. ■

References

- Berntson, E., Sverke, M., & Marklund, S. (2003). Predicting perceived employability: Human capital or labour market opportunities? *Economic and Industrial Democracy*, 27(2), 223–244.
- Brown, P., Hesketh, A., & Williams, S. (2003, June). Employability in a knowledge-driven economy. *Journal of Education and Work*, 16(2), 107–126.
- Campbell, D. (1969). Reforms as experiments. *American Psychologist*, 24, 409–429.
- Campbell, D., & Overman, S. (1988). *Methodology and epistemology for the social sciences*. Chicago: University of Chicago Press.
- Chapple, K. (2005). Promising futures: Workforce development and upward mobility in information technology. *Institute of Urban & Regional Development, IURD Monograph Series*. Retrieved from <http://repositories.cdlib.org/iurd/ms/MG-2005-01>
- Chapple, K. (2006). Networks to Nerdistan: The role of labor market intermediaries in the entry-level IT labor market. *International Journal of Urban and Regional Research*, 30(3), 548–563.
- de Grip, A., & Zwick, T. (2005). *The employability of low-skilled workers in the knowledge economy*. Unpublished manuscript, Maastricht, the Netherlands. Retrieved from http://rlab.lse.ac.uk/lower/final_papers/grip.pdf 2005
- Doms, M., Dunne, T., & Troske, K. R. (1997, February). Workers, wages, and technology. *The Quarterly Journal of Economics*, 112(1), 253–290.
- Donner, J. (2004). Microentrepreneurs and mobiles: An exploration of the uses of mobile phones by small business owners in Rwanda. *Information Technologies & International Development*, 2(1), 1–21.
- European Commission. (2004). *E-skills for Europe: 2010 and beyond*. Brussels: European Commission, Enterprise and Industry Directorate General. Retrieved from <http://ec.europa.eu/enterprise/ict/policy/doc/e-skills-forum-2004-09-fsr.pdf>
- Fan, M., Dey, D., & Peng, G. (2006). *How do computers and Internet affect employee compensation?* Report submitted to Harry Bridges Center

- for Labor Studies, University of Washington, Seattle.
- Fugate, M., Kinicki, A. J., & Ashforth, B. E. (2004). Employability: A psycho-social construct, its dimensions and applications. *Journal of Vocational Behavior*, *65*, 14–38.
- Galperin, H., & Bar, F. (2007). The Microtelco opportunity: Evidence from Latin America. *Information Technologies & International Development*, *3*(2), 73–86.
- Garrido, M., Badshah, A., & Coward, C. (2009). Deconstructing ICT skills and employability. *Information Technologies & International Development: Special Issue on ICT and Employability*, *5*(2), iii–vii.
- Garrido, M., Rissola, G., Rastrelli, M., Diaz, A., & Ruiz, J. (2010). *Immigrant women, e-skills, and employability in Europe: The case of Hungary, Italy, the Netherlands, Romania, and Spain*. Technology & Social Change Group, University of Washington, Seattle.
- Gordon, A., & Sullivan, J. (2008). *Evidence narratives: Storytelling from anecdote to evidence*. Center for Information and Society Working Papers. Retrieved from <http://tascha.uw.edu/research/resources/evidence-narratives>
- Gordon, A., & Sullivan, J. (2009, October). *Evidence-based approaches to community technology research: Applying quasi-experimental and attribution matrices*. Paper presented at the Community Informatics Conference 2009: Empowering Communities: Learning From Community Informatics Practice, Prato, Italy.
- Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, *78*(6), 1360–1380.
- Green, F. (2009). *Employee involvement, technology, and job tasks* (NIESR Discussion Paper No. 326). London.
- Green, F., Ashton, D., & Felstead, A. (2001). Estimating the determinants of supply of computing, problem solving, communication, social, and teamworking skills. *Oxford Economic Papers*, *3*, 406–433.
- Green, F., Felstead, A., Gillie, D., & Zhou, Y. (2007, July). Computers and pay. *National Institute Economic Review*, *201*(1), 63–75.
- Hong, Y. (forthcoming). Debunking a myth of job creation—A critical analysis of China's ICT development from an employment perspective.
- Houston, D. (2005). Employability, skills mismatch and spatial mismatch in metropolitan labour markets. *Urban Studies*, *42*(2), 221–243.
- Lopez-Bassols, V. (2002). *ICT skills and employment*. (Organisation for Economic Co-operation and Development STI Working Papers). Paris.
- Machin, S. (2001). The changing nature of labour market demand in the new economy and skill-biased technology change. *Oxford Bulletin of Economics and Statistics*, *63*(1), 753–776.
- Mariscal, J., Botelho, A., & Gutierrez, L. H. (2009). Training in information and communication technologies (ICT), employment, and youth. *Information Technologies & International Development: Special Issue on ICT and Employability*, *5*(2), 19–30.
- Organization for Economic Co-operation and Development (OECD). (2006). *Information technology outlook*. Paris: OECD Publications.
- Riley, R. (2007, July). Introduction: Technology, jobs and skills. *National Institute Economic Review*, *201*(1), 61–62.
- Rubin, J., Rendall, S. M., Ravinovich, L., Tasng, F., van Oranje-Nassau, C., & Janto, B. (2008). *Migrant women in the European labor force: Current situation and future prospects*. (RAND EUROPE Technical Report). Cambridge, UK.
- Schware, R. (2009). Give for-profit rural business centres a chance to diversify into service-led employment and village BPOs. *Information Technologies & International Development: Special Issue on ICT and Employability*, *5*(2), 77–80.
- Stasz, C. (2001). Assessing skills for work: Two perspectives. *Oxford Economic Papers*, *3*, 385–405.
- Sullivan, J., Gordon, A., & Vander Leest, T. (2008). *Boys & Girls Clubs of America: Technology skills*,

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- youth development and the 21st-century workforce*. Center for Information and Society Working Papers, University of Washington, Seattle.
- Sullivan, S., Carden, W., & Martin, D. (1998). Careers in the next millennium: Directions for future research. *Human Resource Management Review*, 8(2), 165–185.
- van Welsum, W., & Vickery, G. (2005). *New perspectives of ICT skills and employment*. (Organisation for Economic Co-operation and Development STI Working Papers). Paris.
- Vigneswara, P. (2007). *Exclusivity of the direct ICT employment: A case of Indian software*. Proceedings of the 2007 International Conference on Information and Communication Technologies and Development, Bangalore, India.
- Waterman, R. (1994). Toward a career-resilient workforce. *Harvard Business Review*, 72(4), 87–95.
- West, M., & Garrido, M. (2007). *Bridging the e-skills gap in Central and Eastern Europe: The growth of e-skills and employability initiatives in the newly expanded European Union*. Center for Information and Society Research Papers, University of Washington, Seattle.