

# ASSESSMENT OF COMMUNITY WELLNESS OUTCOMES TO MEASURE THE IMPACT OF ICT FOR DEVELOPMENT

Ricardo Gomez

*University of Washington iSchool*

Philip Reed

*University of Washington iSchool*

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## ABSTRACT

Measuring the development impacts of information and Communication Technologies (ICT) for community development (ICTD) continues to be an unresolved problem, especially when trying to include non-traditional development measures beyond economic growth, such as empowerment and social capital. Research on ICTD impact has been mostly focused on description and action, on measuring quantifiable outputs such as number of computers and number of users, or on tangible outcomes such as income and employment, completion of online transactions and acquisition of digital skills. But a growing body of work including our past research shows that the impact of ICTD programs is more frequently related to capabilities and other non-material notions of wellness, and that these aspects are easily missed when looking only at traditional tangible outcomes such as education, health, income or economic growth. We argue for an alternate approach that measures non-material impacts of ICTD, which we term Community Wellness Outcomes (CWO). Assessment of CWO offers a more complete picture of the contributions of ICT to community development than relying solely traditional economic development measures. We examine CWO measuring empowerment, experienced as changes in self-efficacy and aspirations among users of ICT, and social capital, experienced as changes in the nature and extent of their social connections and their civic engagement.

## KEYWORDS

ICT, development, wellness, impact, community

## 1. INTRODUCTION

Information and Communication Technologies (ICT) have attracted billions of dollars of investment in low-income countries as tools to help social and economic development (ICTD) (Heeks, 2008). However, researchers' understanding of the value produced by ICTD interventions is still spotty at best. One substantial gap in research is in measuring those outcomes that are neither traditional economic outcomes nor easily measured quantitatively (Sey & Fellows, 2009). When this set of outcomes is poorly understood, governments or NGOs lack sufficient information for appropriate cost-benefit analysis of ICTD projects. In the worst case, they might overlook these positive outcomes entirely, effectively valuing them at zero.

In this work in progress, we discuss Community Wellness Outcomes (CWO), a contribution to the understanding of non-material outcomes of ICTD interventions. We focus on Public access computing (PAC), one important component of ICTD; PAC extends the reach of computers and the Internet to a broad

sector of the population who do not own computers and who would otherwise not be able to use them to meet their needs.

## 2. THEORETICAL BACKGROUND

The theoretical basis for this project draws from Nobel-laureate economist Amartya Sen (1999), by arguing that ICT contribute to human development in low-income countries by expanding individuals' capabilities in monetary and non-monetary ways. Among those non-monetary outcomes, ICT can make contributions to human development measures such as life expectancy or primary education enrollment, although it is difficult to establish their causal relation because large-scale impacts are the results of many forces operating over long periods of time. Other important non-monetary outcomes of ICT include strengthening empowerment and social capital (Baron & Gomez, 2012; Gomez, 2012b), which can be powerful drivers to enhance people's capabilities, and hence powerful drivers of human development. By looking at observable behaviors and perceived outcomes focused on non-material CWO, we can break the cycle of immeasurable social impacts and offer concrete ways to establish and measure the contributions of ICT to human development.

An effective working definition of empowerment from the psychological literature is “gaining control over one's life and influencing the organizational and societal structure in which one lives” (Segal, Silverman, & Temkin, 1995, as cited in Rogers et al., 1997). Clearly, increasing an individual's empowerment by this definition will lead to increased capabilities<sup>1</sup>, hence empowerment contributes to development.

Development bears a similar relationship to social capital, defined as “features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit” (Putnam, 1995). As an individual's relationships increase in number, depth, and quality, that individual acquires access to more resources through a social network. This increased access expands capabilities (Coleman, 1988), so social capital contributes to development.

Convergent with Sen (1999), we understand development as “a process of expanding the real freedoms that people enjoy,” where freedoms correspond directly to capabilities. In using such an expansive definition of development, we assert that “focusing on human freedoms contrasts with narrower views of development, such as identifying development with the growth of GNP, or with the rise in personal incomes, or with industrialization, or with technological advance, or with social modernization” (p. 3). Development of human freedoms is especially important for marginalized populations, who enjoy substantially diminished freedoms compared to most other individuals in their community or in society as a whole. For example, people with low income are marginalized relative to those with higher incomes, women may be marginalized relative to men, an indigenous community might be marginalized relative to the power structures of the State, or a nation might be marginalized relative to other more developed countries in the world. In all cases, whether referring to marginalized individuals or to marginalized societies, the diminished freedoms may correspond to traditional economic outcomes (e.g., the freedom to earn a living, the freedom to make discretionary purchases) or to other areas such as freedom to live a healthy life or freedom to participate politically.

ICTD encompasses the deployment of technological advances – in particular, computers, computer-based devices such as mobile phones, and the internet – to promote development among marginalized individuals and communities. PAC is an important component of ICT programs for development: it is through non-profit or government telecenters, public libraries, and for-profit internet cafés that marginalized and underserved sectors of the population use computers and the Internet, especially when they do not own a personal computer or when they do not have Internet access at home, at school or at work (Gomez, 2012a).

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<sup>1</sup> Martha Nussbaum, a prominent collaborator with Sen, uses *empowerment* almost as a synonym for capabilities (Nussbaum, 2003, p. 39).

### 3. LIMITATIONS OF EXISTING INDICATORS

Up to this point assessment of development outcomes has focused on either standard economic indicators such as income and wealth or on other easily measurable indicators of a community health or education such as those national data included in the calculation of the United Nations Human Development Index (HDI). For example, the United Nations Millennium Development Goals (MDG) are measured by a mix of one standard economic indicator (poverty) and other national metrics in areas such as nutrition, child and maternal health, HIV/AIDS incidence, total educational participation, and educational participation by gender. Even less familiar measures such as gender composition of national legislatures, metrics of biodiversity, or development assistance as a proportion of developed countries' national budgets figures in assessment of the MDG. ICTD is represented only by measuring the proportion of people with access to the Internet (United Nations, n. d.).

What these assessments do not include are data reflecting the development processes as perceived by individuals served. For example, the proportion of a national legislature made up by women is an important national-level metric, but it can only be a weak proxy for the level of empowerment felt by that nation's women. To take another example, although scholars have treated social capital as a characteristic of a society (Putnam, 1995), the amount of social capital possessed by a subset of that society's individuals (such as ICTD users) might not correspond to societal metrics such as membership data of civic organizations. To really develop an adequate understanding of development outcomes, we need a better understanding of the individual's perspective.

### 4. TOWARD A BROADER UNDERSTANDING OF ICTD IMPACTS

Meanwhile, contemporary ICTD scholars have been cognizant of the need to examine a broader variety of outcomes. Heeks & Molla (2008) identify and analyze in detail 13 frameworks for the assessment of impact of ICTD, spanning a wide gamut of approaches. Although many of these are clearly rooted in traditional measurements (financial cost-benefit analysis) or in organizational theory (the "Enterprise Variables Model"), they also include Sen's capability approach as one of the 13 frameworks.

Other scholars have explored other applications of Sen's work – by theorizing about the specific relationship of Sen's approach to technology (Banerjee & Loo, 2002) or operationalizing it empirically in various ways (Byrne & Sahay, 2007; Garai & Shadrach, 2006; Gigler, 2005; Grunfeld, 2011, p. 154; James, 2006; Johri & Pal, 2012; Zheng & Walsham, 2008). In particular, Kleine (2010) elaborates a "Choice Framework" synthesizing the capability approach and another framework. In her work, empowerment takes center stage, which she understands to be an interaction between structural and agentic factors. She then goes on to operationalize her theory in ethnographic work examining PAC in Chilean non-profit telecenters.

Zheng and Walsham (2008) also make valuable theoretical contributions, distinguishing between "well-being freedom" and "agency freedom". This is a helpful dichotomy to frame our assertion here of the need for better measurements: we need to better understand how ICT helps human beings carry out their own agency, not just how it brings about a better outcome on some external variable. Zheng and Walsham provide empirical support in the form of two case studies, both combining multiple qualitative methods. In summary, the empirical work deriving from the capability approach is extensive and valuable but almost all qualitative.

An exception is one study that uses surveys to examine motivations for ICT use, but treating ICT access as a *capability unto itself* rather than as a facilitator of other human capabilities (Alampay, 2006). In other words, this work views ICT as a means, not an end.

The sheer volume of this work centered on human capabilities validates the need for a deep understanding of technology's effects as perceived by the people affected. Certainly, aggregate societal metrics are well-suited to measuring some capabilities, such as economic ones. On the other hand, ICT expands human capabilities in other more subtle ways that are not well measured by aggregate data. Thus, the growing

interest in applying Sen validates our own belief that merely looking at these externally based societal indicators is insufficient to the needs of ICTD research. However, the research done to understand the perspectives of individuals has been either qualitative or has not been focused on understanding how ICT facilitates other ends.

We address this gap by providing tools to measure the individual-oriented impacts of development which existing indicators such as the MDG leave unaddressed. To facilitate our focus on these particular variables, we now define a category for them.

## **5. COMMUNITY WELLNESS OUTCOMES**

Community Wellness Outcomes (CWO) are a set of outcomes that represent increased individual freedoms, and are not measured by traditional economic indicators such as income or wealth, or by other societal indicators such as those used by the MDG. This project will provide the tools to qualitatively measure two CWO identified as most salient in our previous research: empowerment (related to self-efficacy and aspirations) and social capital (related to social relations and civic engagement). This research will operationalize ways to measure empowerment and social capital, and explore other potentially important CWO that may emerge from the field research of PAC in Colombia.

### **5.1 Empowerment**

We embrace the concept of empowerment as a process rather than an event by which individuals, organizations, and communities gain mastery over their own social and economic conditions, over political processes that affect them, and over their own stories (Steeves & Melkote, 2001). For Kabeer (2002), empowerment also invokes an expansion in people's ability to make strategic life choices in the following dimensions: (1) resources -- acquired through social relationships / institutions (social capital) (2) agency -- the ability to define goals and act upon them (empowerment), with both positive and negative connotations in relation to power, and (3) achievements -- resources and agency constituted together. Achievements range from personal and social to educational. Furthermore, as Campbell & Jovchelovitch (2000) point out, empowerment directly relates to power, which shapes and constrains the community's sense of social identity and representation. This iterative process of building and rebuilding notions of self-identification leads to the construction and redefinition of identities, mainly related to notions of becoming more autonomous persons, of being better connected with other people and cultures, and of being part of a stronger community of national or international citizenship.

For the purpose of our analysis and based on our past research, we now consider two discrete measures that contribute to empowerment: self-efficacy and aspirations.

#### **5.1.1 Self-efficacy**

Bandura (1994) defines self-efficacy as "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations." In its classic definition self-efficacy pertains to some particular function or domain of accomplishment rather than a general reflection of one's own feeling of capability (Luszczynska, Gutiérrez-Doña, & Schwarzer, 2005). For example, in the literature we see numerous examples of measurement of computer self-efficacy (e.g., Cretchley, 2007). However, in contrast to this understanding, other researchers have developed the idea of Generalized Self-Efficacy (GSE) that reflects the extent to which an individual feels able to deal with new situations (Luszczynska et al., 2005). The GSE scale, originally developed in German by Jerusalem and Schwarzer but since translated into multiple languages, is the most widespread tool used to measure GSE. Because we desire to measure the benefit of technology interventions in people's GSE, not only in their computer self-efficacy (for example), the GSE scale is a starting point for our own efforts to assess the self-efficacy impacts of ICTD.

GSE has been found to be a valid construct across dozens of national cultures (Scholz, Gutiérrez-Doña, Sud, & Schwarzer, 2002). However, few researchers have sought to investigate the applicability this scale in

lower-income countries. Scholz et al. (2002) included Costa Rica among their 25 countries, and Luszczynska et al. (2005) included Costa Rica and Turkey in their five-country sample. However, neither study specifically considers the question of the applicability of the GSE scale to developing countries. In the broader literature, there is no indication that the GSE has been used in ICTD contexts.

### 5.1.2 Aspirations

As a construct aspirations reflect the propensity of individuals to hold in mind certain future accomplishments, and the level of those accomplishments. Aspirations work hand-in-hand with self-efficacy: An individual with high aspirations but low self-efficacy lacks confidence to reach her goals, whereas one with high self-efficacy but low aspirations is confident in her ability to reach goals that are not particularly ambitious.

Pal, Lakshmanan, and Toyama (2007) identified aspirations as an important positive result of ICT deployment in their qualitative study of learning centers in rural India. Meanwhile, Kuriyan & Kitner (2009) found that ICT provided symbolic value in support of aspirations to be part of the middle class among female telecenters users interviewed in both India and Chile. Both these findings suggest that ICT can provide value not just in helping users to realize aspirations, but in helping to develop positive aspirations in their own right. However, because both studies were purely qualitative, they still leave open an opportunity to develop quantitative measures of these constructs.

Instruments have been developed to measure aspirations within specific contexts, but none of these applies directly to ICTD. For example, scales developed to measure aspirations of women in the United States of various ages from adolescence to postcollege years (Gray & O'Brien, 2007; Canter, 1979; Nauta et al., 1998; Rainey & Borders, 1997) would require great adaptation for use with library PAC patrons in lower-income countries. Indeed, in one case researchers found that their scale required a different factor structure needed for White or Mexican American groups of adolescent girls, leading them to conclude that "Generalizability of our findings to samples other than predominantly White college-bound or college-educated women is questionable." (Gray & O'Brien, 2007, p. 334) Other scales to assess managerial aspirations (Tharenou & Terry, 1998) or other career aspirations (Wall, Covell, & MacIntyre, 1999), particularly those developed for use in higher-income countries, might likewise need adaptation to maximize their applicability to users of ICTD services. The upshot is that no preexisting scale will automatically prove adequate to our field's needs, hence that we will need to develop, adapt, and assess our own tool drawing on these other efforts but in a way that is specific to ICTD.

## 5.2 Social Capital

Social capital has been defined as "features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit" (Putnam, 1995). In this research we will focus on understanding the individual expressions of social capital, that is, the individual's degree of access to these networks, norms, and social trust. We also regard social capital as the *goodwill* available to individuals or groups, which sources lay in the structure and content of an actor's social relations and its effects flow from the information, influence (power), and solidarity it makes available to the social actors (Adler & Kwon, 2002).

In previous work we have conceptualized the contribution of social capital to development (Baron & Gomez, 2013). Some scholars (e.g., Coleman, 1988) have argued that social capital is unlike all other forms of capital because it is "located" not in the actors but in their relations with other actors. This makes social capital less tangible than all other forms of capital because it exists in the relationships between people and facilitates activity, just as other forms of capital do. However, this form of capital illustrates how non-tangible/non-monetary forms of capital can still support the exertion of power and influence.

Putnam (1995) focuses on features of social organizations such as networks, norms, and trust that facilitate action and cooperation for mutual benefit. Putnam defines social capital as the community cohesion resulting from four features of community: (i) the existence of a dense range of local community

organizations and networks; (ii) high levels of civic engagement or participation in these community networks; (iii) a strong and positive local identity and a sense of solidarity and equality with other community members; and (iv) generalized norms of trust and reciprocal help and support between community members, whether or not they are personally known to one another.

However, one of the risks expressed by authors such as Woolcock (1998) is that high internal linkages combined with low external linkages can produce a situation where internal solidarity is likely to be detrimental to the actors' integration into the broader whole. Furthermore Adler & Kwon (2002) indicate that, depending on the content of its norms and beliefs, a group with strong internal ties but only few external ties may become insular and xenophobic or, alternatively, may use its internal social capital to encourage and help its members reach out to the surrounding world.

Based on our prior research, we will look at two specific components of social capital: social relations and civic engagement.

### **5.2.1 Social relations**

Social relations have been found to be the strongest benefit perceived by users of public access computers, both in developed and in developing countries. By social relations we understand that component of social capital that reflects an individual's number, depth, and quality of relationships. Some research exists developing and testing scales to measure social relations as a component of social capital, but it tends to blur the line between the society and individual as alternative units of analysis (e.g. (Onyx & Bullen, 2000)). For purposes of this project, trying for example to evaluate the effects of ICTD on an entire community's store of social relations is probably too complicated and should be left out of scope. Instead, we will focus on social relations at an individual level, thus necessitating scales that reflect this orientation. Therefore, unless we discover another set of preexisting scales for social relations oriented toward the individual, we will need to adapt those scales that are oriented more towards society as their unit of analysis.

### **5.2.2 Civic engagement**

We understand civic engagement to be “working to make a difference in the civic life of our communities” and “promoting the quality of life in a community, through both political and non-political processes” (Ehrlich, 2000) as cited in “The Definition of Civic Engagement”, 2003). Most of the research deploying scales of civic engagement comes from political science literature, hence tends to measure engagement by political indicators. For example, one study uses the following dependent variables: “E-mails urging voting”, “Attendance at a rally”, “Solicitation (e-mails)”, “Solicitation (call or visit)”, “Financial contributions”, and voting. Political involvement is certainly one important form of civic engagement, but ICT can also enable other forms such as apolitical volunteer work or involvement in community meetings. To fully understand the value that ICT provides in this area, we need to understand what areas are most valuable to the population being studied.

## **6. CONCLUSION**

We have discussed Community Wellness Outcomes (CWO) as alternate ways to measure the impact of information and communication technologies in community development settings. Past work in this field has focused mostly on quantifiable, material outcomes such as income generation or school achievement, health and agriculture information, or participation in e-government activities. Building on Sen's Capabilities approach, we explore the utility of measuring non-material and intangible outcomes of ICT interventions, and suggest that the concepts of social capital and well-being can offer a more sophisticated understanding of the impacts of ICT for community development. By measuring outcomes such as aspirations and empowerment, and self-efficacy and civic engagement, researchers and practitioners can gain useful evidence of the impacts of ICT for community development.

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