

## Research Article

# There When You Need It: The Multiple Dimensions of Public Access ICT Uses and Impacts

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### Abstract

*This article summarizes the findings of a study investigating the impacts of public access to information and communication technologies (ICTs). The research was conducted in seven low- and medium-income countries employing a range of survey, ethnographic, and experimental research approaches. The analysis revealed substantial first-order effects in terms of technology access, information access, and ICT skills development. Second-order effects in domains such as health, education, employment, and income varied considerably, although when public access users had a need in any of these areas, they were generally successful in achieving their goals. The study also found benefits among non-users, a group that includes former users, a largely unexplored dimension of public access.*

Millions of people around the world rely on *public access venues*—libraries, telecenters, and cybercafés—for computer and Internet access and services. Broadly defined as computer and Internet services that are open to the general public, most of these venues are commercial (collectively referred to as cybercafés in this article). Many others, especially in rural and other underserved areas (and typically falling in the category of libraries and telecenters), are supported by governments and development agencies, based on the rationale that having the skills and means to access computer and Internet technology is essential to development in a world increasingly dependent on online resources. Around the world, however, the public access arena is uneven, undergoing changes, and subject to increasing criticism. In many countries, public access is vibrant and dynamic, with a persistent cybercafé market, continued support for existing public programs, and new programs being launched. In other quarters, interest in public access has waned considerably, largely due to changes in the field of information and communication technologies (ICTs) and ICTs and development (ICTD). These transformations such as the spread of mobile phones have raised questions about the effectiveness, or long-term relevance, of public access ICTs in development strategies. These changes have also lent credence to

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the view that public access is primarily an intermediate step on the road to the ultimate goal of private access to computers and the Internet.

However, while it is true that public access functions as a (sometimes temporary) substitute for private access, it may also serve as a (potentially permanent) complement to private access. Careful examination of the public access phenomenon in context can identify conditions that facilitate use and impact under temporary or permanent conditions. Such information can yield important insights to inform venue placement, design, services, rules, and other facets of public access operations, as well as the targeting of facilities to specific domains and populations.

This article presents findings from a multinational study into the impacts of public access ICTs. It identifies types of social and economic impacts, areas of impact, and the populations that experience these impacts. Based on these findings, the article discusses the relevance of public access ICTs in socioeconomic development.

## **What Do We Know About Public Access ICTs?**

Public access ICTs encompass a wide variety of venues in many countries. An important definitional distinction for this study was that both privately and publicly owned venues could be considered public access venues as long as their services were *open to the general public*. In other words, the “public” in public access did not refer to the source of funding or business model of the venue. A cybercafé therefore qualified as a public access venue, while a school library that could only be used by students and staff did not. Considering the prevalence of cybercafés and other similar profit-oriented ICT service providers in low-income countries, it would be remiss to ignore the functions they serve for their patrons.

Although a large body of research exists covering a range of issues surrounding public access venues, the answer to questions about their impacts remains elusive. Current knowledge about public access ICTs includes the following:

- Sustainability challenges continue to plague government- or donor-funded public access venues (e.g., Kumar, 2004; Kuriyan & Toyama, 2007; Proenza, 2008; Sheppard, 2001; Simpson, Daws, & Pini, 2004).
- Privately operated venues such as cybercafés continue to proliferate, but individually are also highly transitory in nature (e.g., Bell, 2006; Kumar & Best, 2006; Oestmann & Dymond, 2001).
- There is a lack of appropriate models for rural settings, which face special infrastructure problems (e.g., Amariles, Paz, Russell, & Johnson, 2006; Best, Kolko, Thakur, & Aitieva, 2007; Blattman, 2003; Parkinson & Lauzon, 2008).
- Patterns of access and use indicate that most users are relatively well-educated young men, and all users primarily engage in communication and entertainment-related activities (e.g., Haseloff, 2005; Hsu & Chuang, 2008; Kleine, 2011; Proenza, 2008).
- There is a perception that venues are generally not delivering meaningful benefits to the target communities (e.g., Ashraf, Hanisch, & Swatman, 2009; Hedberg, 2010; Heeks & Kanashiro, 2009; Pal, 2009; Peng, 2008).

Despite the availability of these studies, a 2009 literature review of the impacts of public access ICTs concludes that

There is limited conclusive evidence on downstream impacts of public access to ICTs . . . As a model, public access to ICTs has experienced success and failure, leading to both reinforcement of the belief that the model should be expanded and strengthened, as well as claims that public access ICTs are ultimately ineffective or even counter-productive from the development perspective. (Sey & Fellows, 2009, p. 1)

This paper contributes empirical data to address this gap in the literature.

## **Methodology**

The study was undertaken in seven countries: five core countries (Bangladesh, Brazil, Chile, Ghana, and the Philippines) and two additional countries of interest (Lithuania and South Africa), representing a diversity of

socioeconomic settings and using a range of survey, ethnographic, and experimental research approaches. As developing or emerging economies, the selected countries are all pursuing national development agendas, which include the common goal of leveraging the benefits of the information society for all their citizens. This study has adopted no specific definition of socioeconomic development. Development is conceptualized in terms of the specific goals that policymakers, donor agencies, and public access practitioners have set, as well as the outcomes that public access users themselves—and non-users—are trying to achieve. We, however, generally favor the view of development as freedom, proposed by Amartya Sen (2000). This investigation into public access ICTs has accordingly been structured to discover how the use of public access can contribute to the enhancement of people's capabilities to do those things they have reason to value and to look at impacts from the user's perspective.

### ***Inventories and Surveys***

First, in each of the study's five core countries (Bangladesh, Brazil, Chile, Ghana, and the Philippines), we conducted an inventory of public access venues to estimate the contours of the public access landscape. Second, drawing samples based on the inventory and other sources of data in each country, we conducted surveys of three populations: 1,250 public access venues operators, 5,000 users in these venues, and 2,000 non-users in the areas surrounding public access venues (Survey Working Group, 2012). The surveys gathered information on venue operational characteristics, design, services, and costs; user characteristics, usage patterns, and perceived impacts of using public access ICTs; and non-user characteristics, reasons for not using public access ICTs, and perceptions of indirect impacts. All surveys took place between 2010 and 2011, conducted by research teams from research or academic institutions in each country. For simplicity, venues were categorized as public libraries, telecenters, or cybercafés. Most countries had an abundance of cybercafé-type venues, while there was wide variability in the existence of telecenters and public libraries providing public access computer services (Figure 1). The sample was distributed across both urban and rural areas, with a higher proportion of urban venues reflecting the typical national spread of public access venues. Sampling was also designed to achieve equal gender proportions; however, in reality, male users dominated at most venues and made up 65% of the final sample.

### ***In-Depth Studies***

Third, we conducted six in-depth case studies to examine a number of salient or contested aspects of public access venues (Table 1). Two studies examined attributes of public access that derive directly from the venues' public character. The first study asked how the role of infomediaries affects the outcomes for public access venue users (Ramírez, Parthasarathy, & Gordon, 2012). Conducted in Bangladesh, Chile, and Lithuania, it drew on infomediary interviews, user focus groups, library manager interviews, and field observations. The second in-depth study surveyed users in two cybercafés in Ghana to examine the forms of collaborative co-present sharing in cybercafés (Best, Garg, Kollanyi, & Fellows, 2012).

A visit to public access venues in most parts of the world would show that their users are often there to play computer games, chat with friends and family, or update their social network page—commonly described as “non-instrumental” uses. Such uses are often contrasted with “serious” tasks like producing a résumé or simulating financial outcomes for a small business and are typically discouraged in public access venues sponsored by public agencies or foundations. Two other in-depth studies looked at non-instrumental uses. One of these studies interviewed users of LAN houses (a form of cybercafé) in Brazil to assess their usage profile, then tested their skills to measure whether there are objective differences in the generic computer skills of gamers as opposed to “serious” users (Kolko, Racadio, Deibel, Krause, & Prempeh, 2012). The other study used a combination of surveys and focus group discussions to determine how Internet technology in cybercafés is used to maintain familial connectedness between migrant parents and their children in the Philippines (Alampay, Alampay, & Raza, 2012).

Mobile phones are now broadly available throughout the developing world, prompting some to wonder whether they might obviate the need for public access venues. A fifth in-depth study explored mobile Internet use among teenage public access patrons in South Africa to identify the roles of public access venues and the mobile Internet in their educational, cultural, and civic-related Web use (Walton & Donner, 2012). It used a combination of interviews, activity/drawing probes, task analyses, and surveys. Finally, a sixth in-depth study

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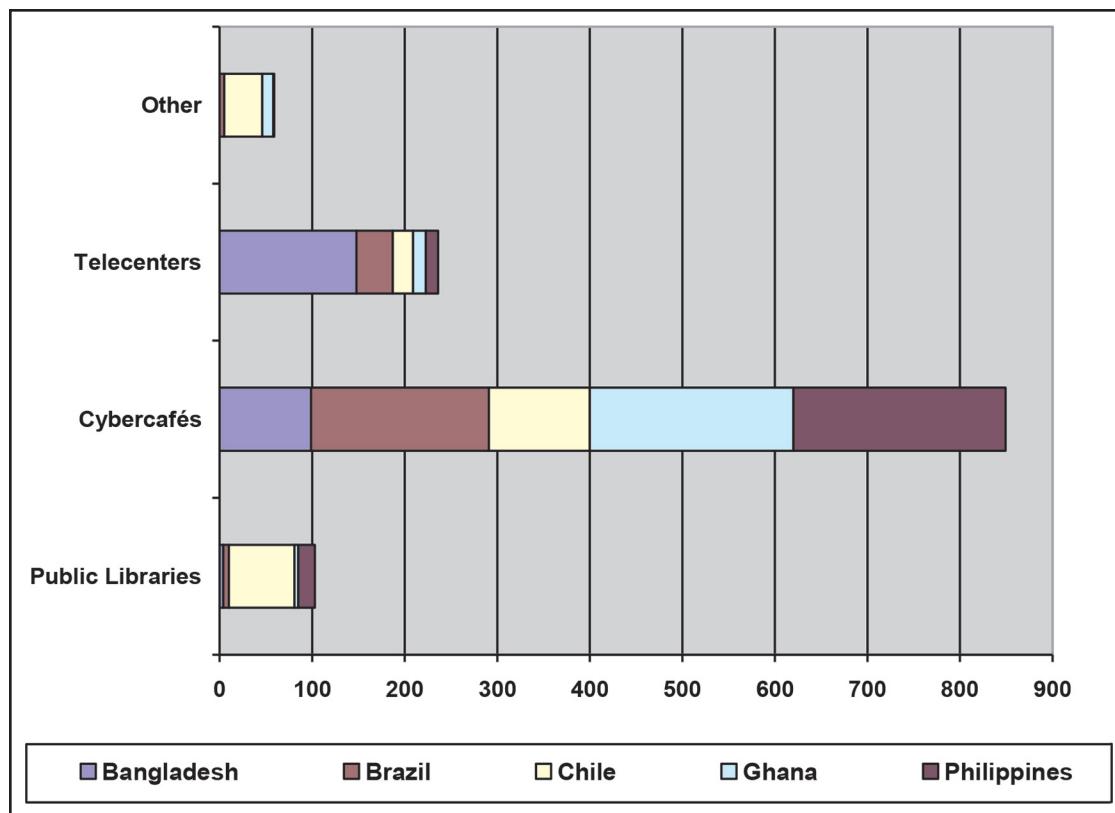


Figure 1. Distribution of venue sample (number of venues).

Table 1. In-Depth Studies.

Topic of Study	Countries	Venues	Methods
Infomediaries	Bangladesh, Chile, Lithuania	Public libraries, cybercafés, telecenters	Interviews, focus groups
Collaborative Sharing	Ghana	Cybercafés	Survey, experiment
Non-Instrumental Uses	Brazil	LAN houses	Survey, skill tests
Interpersonal Communication	Philippines	Cybercafés	Survey, interviews
Mobile Internet	South Africa	Public libraries, cybercafés	Surveys, interviews
Cost-Benefit	Chile	Public libraries, cybercafés, telecenters	Phone interviews

applied cost-benefit methodologies to estimate the monetary benefits of public access venues to users. The study used the travel cost and contingent valuation methods to assess individual willingness to pay to get to (travel cost) and prevent the closure of (contingent valuation) different types of public access venues (Davis, 2014).

### Impact Measurements

A combination of several methodologies was used to provide estimates of the impacts of public access ICT use at the individual level. In most cases, the feasible approach was to rely on self-reports by public access users

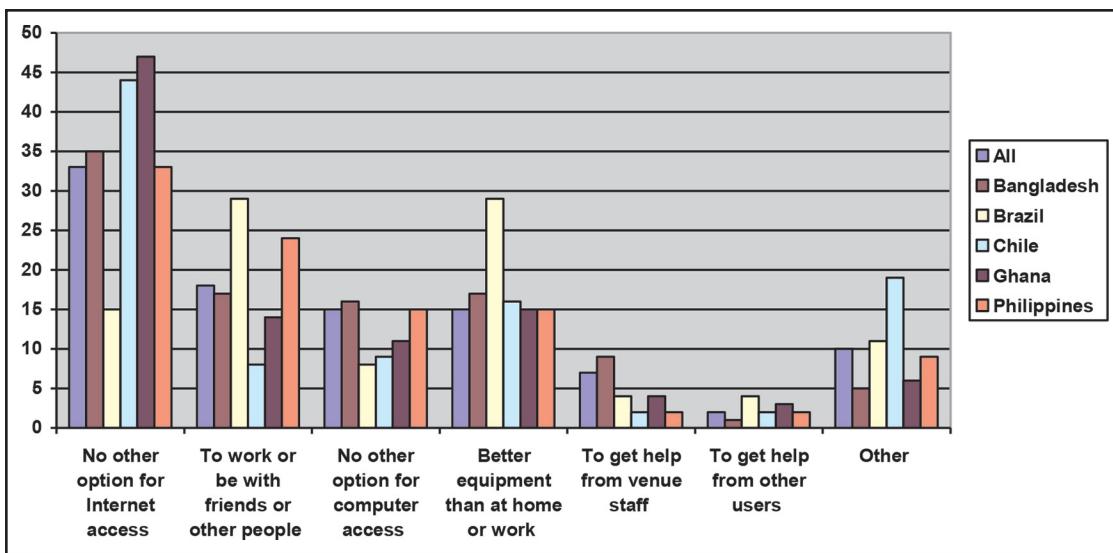


Figure 2. Main reason for using public access venues (%) n=4790.

(their perceived impacts). The surveys asked respondents about the extent to which actual technology use at public access venues had resulted in changes to their social and economic condition. Overall, evidence on the validity of self-reported data is mixed (Bowman, 2010). However, self-reported data can provide valid approximations for objective data despite limitations associated with response bias (see Crockett, Schulenberg, & Petersen, 1987; Junco, 2013). To enhance the precision of the collected data, in addition to asking respondents to report on the consequences (positive or negative) of public access use, survey questions also elicited more concrete information about respondents' actual experience with specific tasks that led to specific outcomes, such as applying for a job or managing an illness and whether they were successful in those pursuits. Finally, certain cases allowed direct measurements of changes in outcome variables. For example, the in-depth study in Brazil examined variations in technology skills by directly testing those skills, though still relying on self-reports to identify the contributing role of public access venue use.

The results discussed in this article draw on a subset of the findings of various study components. Further details are available in separate project reports (Alampay, Alampay & Raza, 2012; Best, Garg, Kollanyi, & Fellows, 2012; Davis, 2014; Kolko et al., 2012; Ramírez et al., 2012; Sciadas, Lyons, Rothschild, & Sey, 2012; Sey, Bar, Coward, Sciadas, Rothschild & Koepke, 2013; Walton & Donner, 2012). Analysis of the data revealed both first-order (access and use-related) and second-order (individual livelihood and well-being-related) effects for both users and non-users of public access venues.

## Dimensions of Public Access Impacts

### **First-Order Effects: Digital Inclusion**

The first-order effects of public access lie in enabling target populations to overcome the limitations (e.g., poverty or lack of appropriate skills) that hamper their ability to access and make productive use of ICTs. We found digital inclusion to be the fundamental first-order effect of public access provision. The five-country surveys identified three types of digital inclusion effects: technology access, information access, and the development of ICT skills.

**Technology access.** Technology access is possibly the heart of the value that users attach to public access—being able to access the technology without having to invest in personal ownership. Indeed, 48% of users surveyed identified lack of personal access to ICTs as their main reason for patronizing public access venues (33% for the Internet and 15% for computers, Figure 2); more than 50% said that their use of computers

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would decrease if public access venues were no longer available. For more than half of all users, public access also provided their first encounter with computers (50%) and the Internet (62%). The proportion was even higher among lower socioeconomic groups and female populations. Considering that a large proportion of public access users are under 25 years old, this finding suggests that for a large number of young people, their upbringing includes public access ICT venues.

**Information access.** Information access flows from technology access, as computers and the Internet are gateways to a wealth of information. The data show that, depending on their needs and skill level, users take advantage of both the technological and human intermediary resources at public access venues to access information that would otherwise not be directly available to them. On the day they were surveyed, almost half the users (47%) had come to the public access venue to look for specific information. Information interests spanned social, economic, and political purposes, with the greatest proportion of users looking for information in the areas of education (58%), entertainment (43%), and employment and business opportunities (32%).

We were further interested in whether users found the information they were seeking and if they were able to put that information to use. The findings were fairly consistent across different domains: In all but one case (finding information on online health services), over 90% of respondents found the information they were looking for through computers at a public access venue. Considering that a public access venue is the only source of access to computers or the Internet for 50% of users, such high levels of goal accomplishment underline the value of public access venues as information gateways.

**ICT skills development.** A critical impact of public access is its role in facilitating ICT skills development. This may be accomplished directly through training and support services, or indirectly by providing a space for hands-on exploration and experimentation with digital technologies as well as collaborative learning. A majority of survey respondents indicated that public access venues were the most important place at which they had developed their computer skills (40%) and Internet skills (50%), far outscoring home (23% and 18%, respectively) and schools (23% and 17%, respectively). The figures were higher for people of lower socioeconomic status, especially income—almost 70% for those with personal incomes below their country's poverty line, compared to 34% of those above the poverty line.

Several of the in-depth studies further bolstered this finding. For example, users in the studies of infomediaries and sharing repeatedly cited "learning" as a key reason they frequented public access venues (Ramírez et al., 2012). Learning in these instances was not limited to formal education or training classes, but often included informal ways of learning: by doing, watching others, playing, communicating with others, or being mentored by thoughtful infomediaries. For the most marginalized populations, these alternative pathways may be especially adapted to their learning styles. Viewed in this light, public access venues can be said to facilitate multiple pathways to digital literacy.

### ***Second-Order Effects: User Perceptions of Social and Economic Impacts***

Beyond digital inclusion, public access can contribute to processes that transform digital inclusion into social and economic impacts. The project surveys elicited users' perceptions on the impacts of public access in five development-oriented priority domains: Culture & Language, Education, Employment & Income, Governance, and Health. An additional domain, Communications & Leisure, was included based on the abundance of data that showed this was a user priority. At first glance, the data show that the highest proportions of users perceived positive impacts in categories related to social, leisure, and educational activities, and that the lowest proportions (high levels of no impact) were in many of the "priority" domains (Table 2).

Overall, there were relatively limited indications of negative impacts, and these mostly related to financial and time expenditures involved in using public access venues.

**Usage patterns and perceived impacts.** As Table 2 shows, users reported high proportions of "no impact" in a number of categories, including those of priority concern to international development. A key question, however, is whether the reported absence of impact meant that users had tried to obtain benefits in these areas and not succeeded, or that they were not in fact seeking those benefits. To address this question,

*Table 2. Overall Perceived Impact from Using Public Access ICTs (% of Respondents).*

<b>Area of Impact</b>	<b>Domain</b>	<b>Positive Impact</b>	<b>No Impact</b>	<b>Negative Impact</b>
Communication with family and friends	Communication & Leisure	83	16	2
Education	Education	79	20	2
Pursuing interests and hobbies	Communication & Leisure	76	21	3
Meeting new people	Communication & Leisure	74	24	3
Pursuing other leisure activities	Communication & Leisure	68	29	4
Time savings	Cross-Cutting	58	30	12
Access to employability resources and skills	Income & Employability	58	40	2
Financial savings	Economic	41	40	20
Access to government information and services	Governance	41	56	3
Local language/culture activities	Culture & Language	36	61	4
Health	Health	38	56	7
Income	Income & Employment	35	55	10
Sending or receiving remittances	Income & Employment	23	72	5

Note:  $n = 5010$ .

responses from those who engaged in a particular domain (defined as use within the last 12 months) were compared with responses from those who did not. Focusing the analysis on the subsets of users for whom the various categories were relevant removed some distortion and provided clearer insight into users' perceptions of impact.

People who had used a particular domain in the last 12 months were the most likely to report positive impacts in related categories. For example, almost 70% of those who had used a venue in the last 12 months for health reasons perceived positive impacts in the Health category, compared to 25% of those who had not. Frequency of use was also important. Among more frequent domain users there was a dramatically higher incidence of perceived positive impacts.

Further insights were captured through a self-assessment focused on a three-part sequence of actions: searching for information, finding information, and taking action. Across all domains, approximately 90% of users indicated that they were able to accomplish information- or service-related tasks that they had attempted in the past. For example, among those using public access ICTs for Employment & Income, 57% searched for a job. Of this group, 89% found the information needed to apply, and 91% applied for a job. These high reported levels of goal achievement indicate that the resources available at public access venues are effective in enabling users to accomplish specific tasks. That is not to say that public access venues are perfect in their service delivery. Important mediating factors may include the level of users' motivation and personal abilities among other things; moreover, users' reports that they have achieved specific goals may or may not be justified. Nonetheless, it was clear that public access users had been able to access the tools they needed to attempt and often to complete specific computer- or Internet-related tasks.

**Target populations and perceived impacts.** Although the data on users show a profile of younger, relatively well-resourced males (Sciadas et al., 2012), the findings on impact perceptions within other user populations offer evidence showing that in terms of outcomes, young middle-class males are not the only beneficiaries. For example, similar proportions of people below and above their country's poverty line reported positive impacts across the 13 impact categories examined. Unemployed users reported positive benefits in similar proportions to employed users, and in one category (communicating with family and friends) the unemployed were more likely to report positive impacts (88% compared to 81%). Additionally, larger proportions of unemployed users (both below and above the poverty line) reported positive impacts in education (80%, compared to 71% for employed users). Perceptions of positive impact increase, however, as education level increases, countering the other trends.

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Female users (though relatively limited in number) also perceived positive impacts similar to males, although male users tended to perceive positive impacts in the economic categories, while female users tended toward positive impact perceptions in the social categories. Higher proportions of older users reported positive impacts in the priority development domains (such as Education and Employment & Income) compared to younger users, who were more likely to report positive impacts in the Communication & Leisure domain. Finally, rural users, based on an analysis in Bangladesh, trailed their urban counterparts across most domains in terms of use and positive perceptions of impact. However, when controlling for such factors as computer experience, frequency of use, and venue type, the differences in impact perceptions largely disappeared.

**Communication and Leisure and perceived impacts.** The role of Communications & Leisure warrants special attention. It is examined from three angles: (1) as a domain, (2) as a means to achieving impacts in other domains, and (3) as a contested issue, reflecting the widespread view that recreational activities constitute frivolous uses of public access facilities. Fully 94% of users in the surveys reported that engaging in Communications & Leisure activities at public access venues had improved their overall ICT skills. Actual skills were assessed in one in-depth study through computer-based exercises administered to users in Brazil (Kolko et al., 2012). The results showed that people who largely used computers for gaming and social networking were as capable with computers as those who used them primarily for instrumental purposes, indicating that computer-based Communication & Leisure activities may offer an alternative pathway to gaining digital literacy.

Furthermore, there was a strong correlation between frequency of engaging in Communication & Leisure activities and positive perceptions of impact across several categories: education, time savings, access to employability resources, local language and cultural activities, health, and income. Two categories that did not follow this trend were financial savings and sending or receiving remittances.

Finally, we examined the extent to which people use email and social networking sites as a way to obtain information in the other domains. The results showed that these applications were the most important online resource (over websites) for 12–37% of users across the 13 impact categories. The in-depth study in Brazil also indicated that users engage in a variety of communication activities (email, online discussions, chat, social networking sites) for instrumental as well as non-instrumental purposes (Kolko et al., 2012).

### ***Hidden Impacts: Non-Users***

Assessments of public access impacts often neglect to examine non-users, although they could constitute past and potential beneficiaries. The household survey of non-users found 19% of non-users surveyed were former public access users, 60% had family or friends who use public access, and 10% had asked someone to use a public access venue on their behalf.

The data reveal two forms of invisible impacts. First, former users indicated that public access had been important to them in the past—35% of former users surveyed said they had their first contact with the Internet at a public access venue. This, we suggest, demonstrates the role public access can play in setting people up for participation in the information society, even if they later move on to private access. Second, non-users reported indirect benefits through the use of public access by their family and friends: Across the 13 impact categories, up to 63% of non-users whose family/friends are users said they perceived positive impacts from other people's use of public access venues.

Thus, the study found evidence that public access impacts can reach beyond those who directly use public access venues at any point in time. Although people with direct access were always more likely to perceive positive impacts compared to those with indirect (or past) access, the indirect uses and outcomes identified in this study are an important component of public access impacts.

## **Conceptualizing Public Access Impacts**

The overview of findings presented above laid the foundation for a discussion of some broad questions about public ICT access from a policy perspective:

- Whether public access remains relevant;
- Whether public access substitutes for private access;

*Table 3. Why Former Users Stopped Using Public Access (%).*

	<b>Have computer at home or work (%)</b>	<b>Use the Internet on a mobile phone (%)</b>
Bangladesh	73	18
Brazil	79	2
Chile	77	4
Ghana	47	32
Philippines	78	9
All	76	7

- How public access is used by priority populations in priority domains;
- Whether venue type matters; and
- How to measure public access impacts.

### ***Is Public Access Still Relevant?***

The evidence from this study suggests that public access, whether publicly or privately funded, is still a relevant model for extending the benefits of ICTs to populations in low- and middle-income countries. Public access venues constitute the only computer and Internet access option for many. These venues are also the place where a majority of users had their first contact with computers or the Internet and learned ICT skills, and they are an important resource for information that users need. Users perceive positive impacts across a wide range of areas, and their use of computers would decline if public access were to disappear. Even among those who have alternative access (e.g. at home or work), public access venues are a valuable resource, for example, when they need better equipment. We also found that public access was important to former users and other non-users, indicating a formative role in introducing new users to computers and the Internet.

The rise of mobile telephony, often cited as the death knell of public access, does not negate this picture. While some venues are experiencing a decline in patronage (*Business Daily*, 2013), the data from our general surveys highlighted two important details: First, the vast majority of current public access users also possess mobile phones (96% of users in the five survey countries). And second, mobile Internet access was rarely the reason former users stopped going to public access venues (Table 3).

The study of South African teens also showed that the emergence of mobile phones as a critical resource had not lessened the importance of public access venues (Walton & Donner, 2012). Even youth who owned mobile Internet devices clearly used and valued the affordances provided by public libraries and cybercafés, with public access venues supporting the development of digital literacies while mobile phones supported daily social literacies. Because mobile phone access has expanded worldwide, this conclusion has broad international relevance. It suggests that (at least for now) mobile Internet access brings important benefits, but has not made public access obsolete.

An additional feature of public access that represents value to users is the physicality of the place. A major driver of public access use is the desire to be with others—not only for social reasons, but also to learn skills and to glean information resources from others. This important function warrants serious consideration—hubs that serve as gathering places can play an important role in the social life of a community. Further, our study of shared use (Best et al., 2012) indicated that in Ghana the main reason for sharing computers in public access venues was not to save money, but for educational reasons: For 45% of respondents, the main reason for sharing was to learn from each other; for 28%, it was to teach others.

A country's stage of connectivity seems to matter, with implications for the best way to configure public access to meet the needs of the population. In countries with low connectivity, public access can stimulate individual curiosity and provide an initial ICT experience. Users in Bangladesh and Ghana (the two surveyed countries with lower connectivity) are especially reliant on staff assistance. In the absence of public access venues, people's ICT use would decline more precipitously than it would for users in the other surveyed countries. However, public access is equally important in higher connectivity countries—particularly for ensuring that all

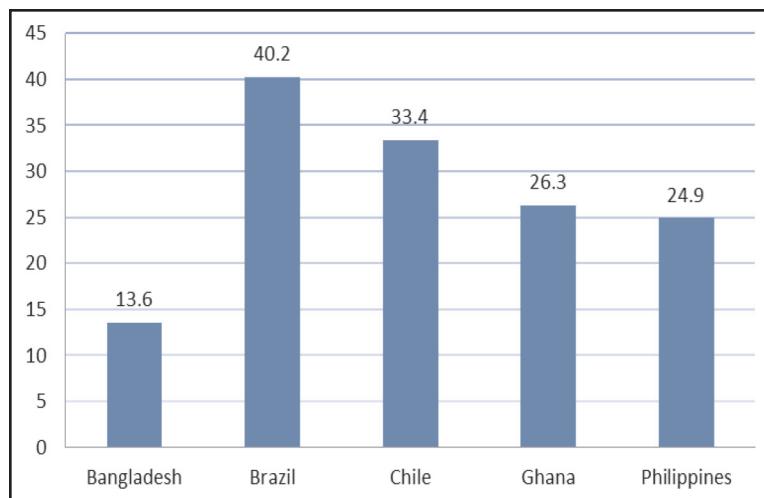


Figure 3. *Public access users with Internet at home (%)*.

residents, especially more marginalized groups, can access the skills and resources to join the information society.

Finally, we propose that public access works as part of an ecology of information and communication resources. In addition to mobile phones, people's information needs are met through TV, radio, and print materials as well as directly from health professionals and others. One form of access does not disappear when another becomes available. People learn to navigate the range of information options to meet their personal needs.

### ***Is Public Access a Substitute or a Complement to Home Access?***

Some countries have experienced rapid growth of household computer and Internet penetration, inspiring the hypothesis that public access venues are a stepping-stone en route to the ultimate goal of widespread household access. The experience of Lithuania illustrates the demise of numerous cybercafés, as home uptake of ICTs has accelerated to the point that most of the remaining public access venues are libraries.

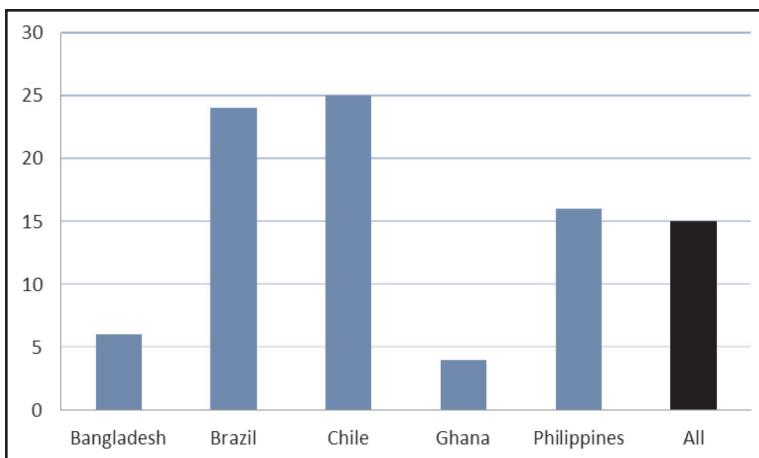
This extent of decline was not evident in our survey countries, although the user survey found a large number of public access users have private access to computers with Internet connections (Figure 3). In Brazil, for example, Internet penetration at home among public venue users was 40% (compared with the 2009 national average of 24%). In Chile, one third of public access users had Internet connections at home, as did about one quarter of users in Ghana and the Philippines. In all countries—even in Bangladesh, with the lowest share—the percentage of public access users with ICTs exceeded the average home penetration in that country.

What attracts these people to public access when they could use ICTs in the comfort of their homes? Several possibilities are suggested by users' main reasons for using public access venues: better equipment, faster connections, access to infomediaries and peers for needed help, and the sharing experience. Other reasons, gleaned from the in-depth studies, include competition from family members at home and the benefits of socialization in public venues. Whatever the reasons, the fact remains that having home access has not led to the disappearance of those users from public access venues.

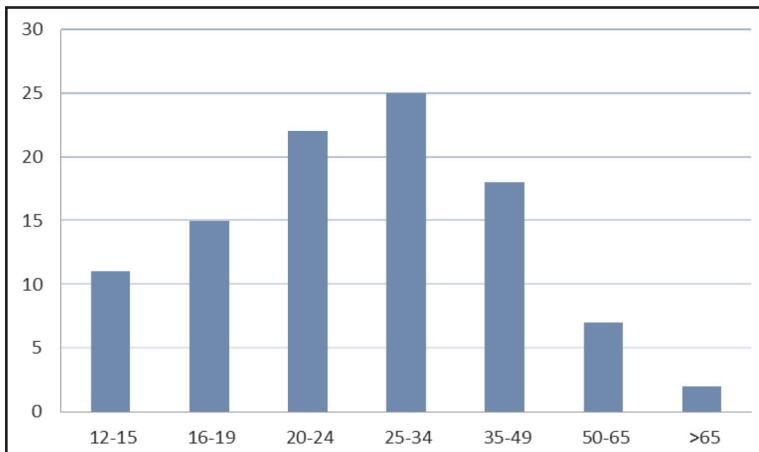
On the other hand, data from the non-user survey confirm that the stepping-stone thesis is also at work and, indeed, quantifies it. The data reveal that about 15% of non-users were former public access users who now use computers elsewhere (Figure 4). The percentage is particularly high for young adults, rising to 25% for the 25–34 age group (Figure 5). More than half of the non-user group had been very frequent users (daily or at least weekly), and about three quarters reported that they stopped going because they acquired private computer and Internet access.

Both tendencies, then, can be observed: Some users stopped going to public access venues as a result of private access, while others with home access continued to be regular public access users. For this latter group, public access is complementary to private access. This can be explained in terms of the evolution of the penetration and use of ICTs, pointing to the mutual reinforcement of multiple access modalities. Based on all indicators to date, we can say that many developing countries are at the early stages of ICT penetration. Moreover, the rates of adoption are not comparable to those seen in Western countries in the past two decades. It may take decades for some countries to reach saturated levels of home connectivity. Thus, even under the stepping-stone scenario, public ICT access is likely to remain a critically important service.

Finally, some of these countries may be developing their own distinctive modality of ICT use, reflecting their



*Figure 4. Percentage of non-users who are former public access users and now use computers elsewhere (n = 1,974).*



*Figure 5. Former public access users who now use computers elsewhere, by age (%) (n = 387).*

impacts in most of the priority domains (except Education). The Communications & Leisure domain shows a much higher percentage of users impacted. However, large proportions of those users engaged in the high-priority domains report they do achieve specific objectives and experience positive impacts. We argue that low popularity of an activity or low frequency of use in a particular domain does not mean low importance. For instance, even though twice as many users reported a positive impact on "pursuing interests and hobbies" compared with "health," accessing critical health information is likely important to those who had need of public access for this purpose.

When considering frequency of use in particular, it may be appropriate to characterize people's activities at a public access venue in terms of whether they are routine or episodic in nature. Routine uses can be described as those activities one is likely to engage in on nearly every visit to a public access venue, including activities such as email, social networking, and general entertainment. For student users, educational activities would also most likely fall into the routine category. Episodic uses would be those activities done less frequently or as the need arises such as accessing government services or looking for a new job. These are generally more likely to be in the realm of the priority domains for development initiatives.

cultural norms, communal attitudes, or practical considerations. These modalities may emphasize the value of rationing use, sharing premises or workstations, and learning collaboratively. Both trends—the rate of adoption and the emergence of distinctive modalities—need to be monitored over time.

#### ***Uses and Impacts in Priority Domains***

Most public and donor initiatives focus on the use of public access facilities for activities in specific domains: Education, Governance, Health, and so on. These are considered "productive" uses of computers, and any sign of low use in these target domains is often interpreted as a failure of the publicly funded access model. A similar critique relates to observed high levels of use in the Communications & Leisure domain: Activities on Skype and Facebook as well as computer games, for example, are typically viewed as unproductive activities that do not merit public subsidy. Commercial public access venues are seen as catering to these needs.

The study data indeed show a relatively low percentage of users overall (below 40%) who report

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Since (as the data show) public access users visit venues frequently, and in many cases daily, their episodic uses are likely to be varied and infrequent, relative to all their other activities. One is unlikely to access a government service every day, in contrast to sending an email to a friend, for example. It is therefore inappropriate to assess every activity by the same standard. Rather than comparing usage rates for different activities, it may be more productive to evaluate those rates on the basis of the typical frequency of such activities as well as the proportion of the population that one might expect to engage in (and benefit from) specific activities.

This understanding of usage patterns provides context for the sometimes-numerous “no impact” responses for particular impact categories. In fact, “no impact” responses were overwhelmingly linked to non-use in the domain. Non-use, in turn, appeared to be related to whether a particular area of activity was relevant or even feasible for the user. For example, an individual who is not experiencing health issues and who has relatively low interest in that area is unlikely to spend much time researching health information and services online and would accordingly report “no impacts” in the area of health. Likewise, where no government services are available online, people will experience “no impacts” in that domain.

Regarding Communications & Leisure activities, the results of this study challenge the commonly held view that these activities do not lead to productive outcomes. Most obviously, people rely on both email and social networks to accomplish instrumental tasks, such as requesting information or seeking employment. Less obviously, playing games and engaging in other leisure pursuits in fact build important computer skills that are transferable to the workplace. The in-depth study of non-instrumental uses in Brazil found no difference in the ability of instrumental and non-instrumental users to accomplish specific instrumental tasks. This has important implications for public policy, in recognizing the utility and value of this common area of activity. For public access facilities operators, it is also significant in deciding on the specific restrictions to place on non-instrumental activities. Moreover, current trends worldwide show the growing value of social networks for individuals for a range of outcomes. From networked job referrals to political uprisings, there is evidence that “virtual” social ties have real-world importance, enriching the lives of people and combating social isolation. Indeed, it is impossible to predict the downstream impact of any particular act of communication or sharing.

### ***Measuring Public Access Impacts***

With significant resources expended on public access facilities (particularly the nonprofit variety), policy makers naturally seek evidence of social and financial returns on investment—which are notoriously difficult to pin down in direct and unambiguous ways. Is it possible to infer causal linkages between a user’s activity at a public access venue and subsequent changes in the user’s life? Can those changes be attributed wholly to public access? Or did the venue contribute in another way to those impacts? This study provides some support for the contribution case.

It is difficult to determine that a particular outcome was a direct result of using ICTs at a public access venue, or of using ICTs (irrespective of the location of use), or of some external factors unrelated to ICT use or use context. In the Employment & Income domain, for example, we asked survey respondents whether they had looked for a job, whether they found this information, and (if yes) whether they had used the information they found to apply for a job. The logical next question is whether they got the job. But how would we interpret that answer? If the individual got the job, was it because they applied for the job at a public access venue, or might they have applied elsewhere and still gotten the job? Or, if they did not get the job—e.g., because they lacked the qualifications or there were better candidates—would that represent a failure of public access? These types of questions emerged consistently in each domain.

Certainly some methodologies (such as experiments or randomized controlled trials) might be able to tease out some of these factors, but this would be a complex approach with the current state of the field. Moreover, because the public access phenomenon has so many facets, variants, and realms of influence, much is bound to be overlooked in any attempt to measure impacts out of their real-world context. For now at least, it is reasonable to conclude that public access contributes to the process of pursuing specific goals, but cannot always be determined to cause (or not cause) particular impacts. This role is critical and provides a foundation for continuing benefits over time—similar to the role of education—in contributing to an individual’s later economic success.

Furthermore, estimates of the impact of public access on users capture only part of the story. There are two populations of interest that are rarely considered in measuring the impacts of public access: people who have used public access in the past but no longer do, and people who do not personally use venues but derive benefits indirectly from those who do. We have demonstrated that both groups derive benefits from and ascribe value to public ICT access.

One underlying goal of most development efforts is to reduce levels of social exclusion, a condition that fosters the cycle of poverty and disadvantage. The increasing dominance of ICTs as the medium of choice for the information society adds a new layer to the problem: Those already excluded become more excluded because they are unable to participate in this new form of interaction, while some who were previously included may now become excluded if they cannot adapt to the changing times. At the same time, these technologies also have the potential to facilitate social inclusion by eliminating some of the barriers of time, space, and expense that restrict individual advancement. From this point of view, simply enabling people to participate is an important and desirable impact, even before assessing the quality of participation and its direct impacts. When we examine public access from the perspective of social inclusion, the impact question changes: By virtue of having public access, are people more socially excluded or less? Are individuals' life chances improved by enabling technology access (even though social inequities may persist in other areas of their lives)? This is a different approach than asking whether public access leads to a 10% increase in income.

Finally, measuring public access impacts requires that questions be asked about the timeframe for trying to identify impacts. With very different rates of ICT diffusion, public access deployment, and uptake, what are the implications for the rate of emerging impacts? Will these take six months? Two years? Longer? Do some impacts take longer to manifest than others? And do some impacts intensify or dissipate over time?

## Conclusion

For a meaningful economic and social life, people need multiple capabilities: a means of generating income, opportunities for formal and informal learning, ability to maintain their health and well-being, access to local and national government, ability to exercise informed democratic rights and obligations, and ability to observe and participate in the production of their cultural heritage. More could be added to this list: having the resources to build, maintain, and enhance social connections as a capability with potentially far-reaching implications for livelihoods and well-being. Neither should we devalue the human importance of leisure—the ability to play, laugh, and pursue personal interests or desires. These are all components of a good quality of life.

Arguably, what public access venues offer users is greater ability to *pursue* these ends. The broader social, economic, and political context will determine whether exercising these abilities translates into specific social or economic indicators: increased income, employment, admission to college, improved health, or preservation of culture. When considering public access as a development tool, it is important to recognize the fundamental nature of the services these venues provide and thereby adopt a realistic stance toward expectations of specific types of impact. ■

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