Connecting people for development: Why public access ICTs matter

Global Impact Study of Public Access to ICTs
Final research report

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ABOUT THE GLOBAL IMPACT STUDY

The Global Impact Study of Public Access to Information & Communication Technologies was a five-year project (2007-2012) to generate evidence about the scale, character, and impacts of public access to information and communication technologies (ICTs). Looking at libraries, telecenters, and cybercafés, the study investigated impact in a number of areas, including communications & leisure, culture & language, education, employment & income, governance, and health.

Implemented by the University of Washington's Technology & Social Change Group (TASCHA), the Global Impact Study was part of *Investigating the Social & Economic Impact of Public Access to Information & Communication Technologies* — a broader CAD$7.9 million research project supported by Canada's International Development Research Centre (IDRC) and a grant to IDRC from the Bill & Melinda Gates Foundation. Managed by IDRC, this project included the *Global Impact Study of Public Access to Information & Communication Technologies* (this project) and *The Amy Mahan Research Fellowship Program*, led by Universitat Pompeu Fabra, which aimed to deepen the capacity of emerging scholars with the goal of increasing the quality and quantity of research on public access to ICT produced in developing countries.

TECHNOLOGY & SOCIAL CHANGE GROUP

The Technology & Social Change Group (TASCHA) at the University of Washington Information School explores the design, use, and effects of information and communication technologies in communities facing social and economic challenges. With experience in 50 countries, TASCHA brings together a multidisciplinary network of social scientists, engineers, and development practitioners to conduct research, advance knowledge, create public resources, and improve policy and program design. Our purpose? To spark innovation and opportunities for those who need it most.

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Each of the in-depth study Principal Investigators contributed to this volume: Erwin Alampay, Michael Best, Tyler Blake Davis, Jonathan Donner, Andy Gordon, Beth Kolko, Balaji Parthasarathy, Ricardo Ramirez, and Marion Walton.

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RESEARCH SUPPORT

ABSTRACT

Libraries, telecenters, and cybercafés play a critical role in extending the benefits of information and communication technologies (ICTs) to a diverse range of people worldwide. However, their ability to contribute to development agendas has come into question in recent times. The Global Impact Study was designed to address this debate by generating evidence about the scale, character, and impacts of public access ICTs in eight countries: Bangladesh, Botswana, Brazil, Chile, Ghana, Lithuania, the Philippines, and South Africa. This report summarizes the study's key findings, situating public access in the context of national development, discussing some disputed issues, and providing recommendations for policymakers, public access practitioners and researchers. The results show that a central impact of public access is the promotion of digital inclusion through technology access, information access, and development of ICT skills. Both users and non-users report positive impacts in various social and economic areas of their lives.

SUMMARY

Libraries, telecenters, & cybercafés play a critical role in extending the benefits of ICTs to a diverse range of people worldwide.

KEYWORDS

cybercafés, libraries, telecenters, ICTD, ICT4D, digital inclusion, e-Skills, public access, e-Inclusion, impact, open research, open data, information access, infomediaries, mobile phones, Bangladesh, Botswana, Brazil, Chile, Ghana, Lithuania, Philippines, South Africa

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Research Partners

Located in leading universities and research institutes around the world, our research partners contributed to overall research design, data collection, and analysis, as well as led various components of the project as investigators of in-depth studies and heads of country-based studies. Their contributions are reflected throughout this report as well as in numerous other reports, articles, and outputs.

Name	Institution	Role on the Global Impact Study
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Marion Walton	University of Cape Town, Centre for Film and Media Studies	Co-Principal Investigator, Mobile Internet Study

The research partners collected data from thousands of individuals across eight countries. Without their active participation, this study would not have been possible.

Research Advisors & Contributors

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Students

Five University of Washington students contributed to the study as student employees: Michelle Fellows conducted extensive literature reviews, created website content, and completed other research tasks; Stephanie Earls provided general project and communications support; Alex Tulinsky developed and managed the inventory database and web library; Yuan Chiam performed statistical analysis; and Ajay Alfred designed infographics based on the study and findings.

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Other Contributors

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Technology & Social Change Group (TASCHA) Staff

The entire TASCHA staff was involved at various stages of the project.

Melody Clark served as the study's research coordinator and communications manager, managing numerous project components and leading overall communication and other outreach activities. Maria Garrido provided advice and assistance in many areas, including survey instrument review and translation services. Karen Hirst assisted the project as the administrative coordinator, providing administrative and logistics support throughout the project. Elly Krumwiede assisted the study with writing support. Christine Prefontaine developed the project's communication strategy and oversaw its implementation for the first three years, before transitioning to providing the project with knowledge-sharing and communications advisory services. Rebecca Sears contributed to early research design activities and provided ongoing research management. Joe Sullivan provided design and layout services.

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Letter from the Sponsors

The growth of the internet has been met with much optimism – from improving business efficiency to opening the world of knowledge, information, and communication to the world. In most industrialized countries, broadband connectivity continues to improve and expand, and while this is also happening in developing nations, internet access or affordability remains a challenge for many people living in the these places. The International Telecommunication (ITU) reported, in the 2012 edition of *Measuring the Information Society*, that the cost of internet services remains prohibitively high in low to medium income countries, especially in relation to people's purchasing power. As a result, only 24.4% of individuals living in developing countries had access to the internet in 2011, compared to 70.2% of those living in developed nations.[1] So how can the benefits of the internet become more inclusive?

Beginning in the 1990's, governments and donor organizations began to invest heavily in public access to computers and the internet in the hope to bridge the "digital divide" and to enable people to access critical resources needed for leading a successful, fulfilling life in a world that is increasingly connected online. The anticipated results were that people in developing countries, particularly those who could not afford computers and internet access, would realize improved economic, social and political conditions. Today, because of public and private investments, telecentres, libraries, and cybercafés are a prominent feature of the information and communication landscape in every part of the world.

While many funding agencies and governments continue to value public access, the prevailing opinions on its cost and benefit have shifted.   Many funders, especially government institutions, have begun to question the necessity to support public access initiatives by using public funds. A number of funders, however, have gone further and questioned the need to provide public access in developing countries. The impression is that the facilities are underutilized and that some uses, such as games, are not worthy of investment. Furthermore, prior research on the impact of public access has been inconclusive. As a result, with the rapid growth of mobile phones, and the more recent increase in mobile internet subscriptions, many funders have moved away from supporting public access.

It is against this backdrop that the Bill & Melinda Gates Foundation and Canada's International Development Research Centre (IDRC) commissioned this study in 2007. The study aims to develop a better understanding of the impact of public access venues in diverse settings around the world, covering all models of access. This report presents the findings of this study. It is the culmination of work done by an international team of researchers who designed a fresh and rigorous approach to measure, collect, and analyze data on the impacts—positive and negative—of public access in people's lives.

The findings are illuminating, and likely to contain surprises for many. The report shows that a significant number of people in developing countries continue to rely on services provided by public access venues, despite the continued expansion of mobile phones and mobile Internet. Public access venues remain, for many citizens, the only means of accessing the internet, and they build important digital skills that people use throughout their lives. When people have particular needs, such as finding government or

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[1] International Telecommunication Union. *Measuring the Information Society*. 2012 Edition - http://www.itu.int/ITU-D/ict/publications/idi/material/2012/MIS2012_without_Annex_4.pdf.

health information, public access is there to serve. Furthermore, the presence of a knowledge worker, such as a librarian, often ensures that help is always available to public access users. In Bangladesh, for example, more than half of the survey respondents said that they used staff assistance every time they visited a public access venue. Even people who can afford internet access at home or through mobile phones continue to use public access venues because there are advantages not found elsewhere. Public access also appears to be delivering positive benefits for disadvantaged groups, and to entire communities who benefit from public access use to connect with family and friends. Women, in particular, frequented libraries and telecentres, especially in Chile and Brazil. There are also intriguing findings about the value of social networking and games, as well as the interplay between mobile phones and public access. Overall, while there can be improvements made to the way public access venues are operated, the dominant theme is one that portrays the many benefits that public access provide to individuals and communities that is not reported elsewhere.

We hope that the findings of this research will be useful for decision makers in governments and funding organizations responsible for setting policies and making investment decisions regarding public access. Public access practitioners can also use the findings to improve the level and quality of services they offer. The project sponsors have ensured the research results will become publicly accessible, and for the first time in our respective institutions, we are committed to make the research instruments and data freely available as well. Future research initiatives can take advantage of this opportunity, and advance the knowledge gained through this research.

We are grateful to more than 30 researchers around the world who took part in this undertaking. In particular, we would like to recognize the staff of the Technology & Social Change Group (TASCHA) at the University of Washington Information School who skillfully coordinated and led this study.

Deborah Jacobs
Director, Global Libraries Initiative
Bill & Melinda Gates Foundation

Naser Faruqui
Director, Science and Innovation
International Development Research Centre

Definitions

Connected: For the purposes of this report, the term "connected" refers to venues that have public access computers (with or without internet access). Telecenters and cybercafés are inherently "connected," whereas public libraries (especially in low-income countries) do not by default have computers for public use. In these cases, reference is made to "connected libraries," to distinguish them from public libraries that do not offer computer and internet access to the general public.

Cybercafé: Cybercafés are profit-oriented organizations that provide computer and internet access to the general public for a fee. In this study, the term includes organizations that provide only computer access without internet access. (Note that in some countries the line between cybercafés and other types of venues is blurred due to differences in nomenclature and venue organization.)

Information and communication technologies (ICTs): References in this report to ICTs at public access venues refer to computers both with and without internet access. Other types of ICTs, such as mobile phones, are not included in this definition.

Impacts, effects, and outcomes: The terms "impact" and "effect" are used interchangeably for the purpose of this report. "Outcomes" are steps in a progression of activities leading to impact. For example, searching for employment information, finding employment information, writing a resume, and applying for a job are all outcomes that contribute to impacts in Employment & Income. Impacts (or effects) are broken into first-order and second-order effects. In the context of this study:

- First-order effects relate primarily to gaining physical access to ICTs and addressing digital divides with respect to information access and digital literacy.
- Second-order effects refer to ICTs' influence on people's lives, in the study's domains of focus – Communications & Leisure, Culture & Language, Education, Employment & Income, Governance, and Health.

Impact categories: Impact categories are 13 areas in which the study seeks survey respondents' views on whether or not they have experienced some impact. In contrast to the generality of impact domains, impact categories are narrower and in most cases are subsets of the broader impact domain. For example, the impact categories of *access to employability services* and *sending or receiving remittances* fall under the Employment & Income domain.

Impact domains: These are the broad areas in which the study explicitly sets out to identify impacts: Culture & Language, Education, Employment & Income, Governance, and Health. These five "priority" domains are typically of paramount interest to governments and international development agencies. Communications & Leisure is also included here as a high-level domain, although debates persist as to whether the uses associated with this domain constitute legitimate developmental activities.

- **Communications & Leisure** – The Communications & Leisure domain covers the recreational, interpersonal communication and social interaction aspects of people's lives. It includes activities such as contacting friends and family, playing games, and pursuing hobbies.
- **Culture & Language** – The Culture & Language domain relates to participation in the creation and maintenance of community, national, or other type of identity. It includes activities such as searching for cultural events and producing online content in local languages.

- **Employment & Income** – The Employment & Income domain relates to the income-generating sphere of people's lives. It includes elements such as overall income, access to employability services, searching and applying for jobs, and sending or receiving remittances.
- **Education** – The Education domain covers formal and informal educational undertakings. It includes activities related to formal education such as taking a class, applying for admission, or doing homework, as well as less institutionalized activities such as general information searches on topics of personal interest.
- **Governance** – The Governance domain is narrowly defined to apply to the provision and use of government services. It includes activities such as finding and accessing online government services.
- **Health** – The Health domain refers to health and wellbeing. It includes elements such as searching for information about a medical condition, finding a doctor, and using online health services.

Infomediary: A person who combines a set of technological resources and coaching skills to provide an interface between users and information resources, such as librarians, telecenter staff, and cybercafé employees.

LAN: Local area network. A computer network that interconnects computers in a limited area, such as a school, library, or office building.

Public libraries: In the context of this study, "libraries" refers to non-profit libraries that offer computer access, with or without internet, to the general public. Private libraries that restrict computer and internet services to select audiences are not included in this definition.

Poverty line: All poverty lines referred to in this report are country-specific and not adjusted for purchasing power parity (PPP) or any other normalization. They were provided by the local research teams and are based on the national definitions of poverty in each country at the time of the survey. For a list of the poverty lines as defined by each country, see Appendix 2.

Priority populations: Priority populations are those groups of people typically identified as being of policy importance to reach through public access venues. They include, for example, people of lower socioeconomic status (implying lower education as well as lower income), females, youth, older people, and rural residents.

Private access: "Private" in this context, contrasted with "public" (see below), does not refer to private ownership or funding but rather to access in a private setting, such as home, school, or a workplace closed to the public.

Public access venue: The term "public" in "public access" refers to the characteristic of venues that are open to the public and do not have restrictions on who can use them. "Public" as used in this report does NOT refer to a venue's legal status or source of funding (i.e., it does not indicate governmental support). For the purposes of this report, "public access venues" refers to facilities with substantial, and usually visible, ICT presences. In addition to traditional cybercafés and telecenters, this category would include (for example) a coffee shop with a large number of computers connected to the internet. However, a restaurant with one computer in a corner would not be included, as its ICT service provision would not be substantial.

Rural: The designation of a venue as rural or urban is based on the official country definitions, as provided by the research teams. See Appendix 2 for a list of the definitions of urban and rural.

Telecenter: The generic name given to places that offer ICT access to the general public, usually associated with serving some social objective. Although generally not-for-profit, they tend to operate as commercial entities pursuing financial self-sustainability. Note that in some countries the line between telecenters and other types of venues is blurred due to differences in nomenclature and venue organization.

Executive Summary

This report presents the first results of the *Global Impact Study of Public Access to Information & Communication Technologies,* a five-year project (2007–2012) aimed at generating evidence about the character and impacts of public access to information and communication technologies (ICTs). Looking at libraries, telecenters, and cybercafés, the study investigated impact in a number of areas, including Communications & Leisure, Culture & Language, Education, Employment & Income, Governance, and Health.

Background

Millions of people around the world rely on public access venues — libraries, telecenters, and cybercafés — for computer and internet access and services. Whether to obtain health information, learn computer skills, communicate with friends and family, or play games, public access venues enable people to participate in the information society. Most of these venues are commercial: internet cafes, LAN houses, and other types of paid access that are referred to in this report collectively as *cybercafés*. 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. As these investments continue to grow, questions are being raised about their impact, particularly:

- What are the social and economic impacts of public access to ICTs?
- What is the magnitude of these impacts, and how can they be measured?
- What is the relationship between the costs and benefits of providing — and using — public access ICTs?

The Global Impact Study investigated these questions in eight countries, representing a diversity of socioeconomic settings within the spectrum of low and middle-income countries: Bangladesh, Botswana, Brazil, Chile, Ghana, Lithuania, the Philippines, and South Africa.[2] A range of survey, ethnographic, and experimental research approaches were employed, including: structured inventories of public access venues in six countries; nationwide general surveys of public access venue operators, users, and non-users in five countries; and in-depth case studies on specific topics in eight countries. In addition to positive impacts, the study attempted to capture negative impacts as well as the absence of impacts. Special attention was given to exploring the impacts on the specific populations (e.g., lower

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[2] This report covers seven of these countries. Data from the eighth country, Botswana was not available for this report and will be released separately.

socioeconomic status, females, youth, elderly, and rural residents) and domains (e.g., Health, Employment) that tend to be the target of international development efforts.

Recent global poverty data show that the majority (70%–80%) of the world's poor now live in middle-income countries (Sumner, 2012). The Global Impact Study findings confirm that public access ICTs are an important component of the broader ecology of information and communication resources available in the countries studied – of which all but Bangladesh are classified as middle-income countries by the World Bank. As developing or emerging economies, these countries are all pursuing national development agendas which include the common goal of leveraging the benefits of the information society for all their citizens. All have some level of appreciation for the role that public access ICTs could play in pursuing these agendas. However there is some turmoil: In many countries, the public access sector is vibrant, with a persistent cybercafé market, continued support for existing public programs, and new programs being launched. In other quarters, especially among development agencies, interest in public access has waned considerably, largely due to changes in the field of information and communication technologies and development (ICTD), even since the inception of this study in 2007, which have raised questions about the effectiveness, or long-term relevance, of public access ICTs in development strategies.

An early understanding of the ICT landscape viewed public access as merely an intermediate step on the road to the ultimate goal of private access. The research findings support a more nuanced understanding: public ICT access can function both as a (sometimes temporary) substitute for private access, but also 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. This 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. Although some of the results presented in this report analyze differences in the impacts of public access between countries, the research is structured to go beyond national comparisons to analyze variables across categories of user populations, domains of impact, and types of public access venues. Those who make use of this research need to be able to situate their own countries or interests within the range of contexts presented here.

Significance of public access ICTs in the developing world

The eight countries in the study represent diverse infrastructure and usage environments. In terms of private ICT access, Bangladesh, Botswana, and Ghana are the least resourced (with 3-6% of the population having internet access at home). Lithuania, Chile, and Brazil are the best resourced (38-62% home internet access); and the Philippines and South Africa fall in the middle (10-15% home internet access). Yet each country has an active public access landscape, patronized by individuals both with and without private access to ICTs. In each country, public access remains relevant to different populations for different reasons – for some it is the only source for computer and internet access, therefore critical at a most foundational level; for others the equipment at public access venues are more suited than home or work access for certain tasks; and for yet others, the social space at public access venues is more important than the technological resources. This demonstrates that the value of public access ICTs is not limited to countries with very low levels of digital connectivity. Public access is equally important in higher connectivity countries, supporting multiple modalities of access, and ensuring that marginalized groups can access the resources to join the information society. There is reason for both widespread and strategic support for public access availability in low and middle income countries.

On the other hand, public access ICTs can be understood to have varying significance in each country. The specific shape of the public access sector, and the roles that venues play differ from one context to another, depending on overall levels of connectivity, history of access and familiarity with ICTs, presence of different models of public access, extent of public access use (current and historical), as well as public policies. For example, in countries with low connectivity, public access can stimulate individual curiosity, provide an initial ICT experience and support new users to develop long-term digital skills. Users in Bangladesh and Ghana (countries with low national connectivity) are especially reliant on staff assistance. They reveal that in the absence of public venues their use of ICTs would decline more precipitously than that of users in the other surveyed countries.

While all venue models have value, findings from Bangladesh and Chile illuminate the critical role of publicly/donor-supported venues. Nearly half of survey respondents in Bangladesh use staff assistance every time or most times they visit a public access venue, and in rural areas, public access would be unavailable for most without the presence of telecenters. In Chile, the widespread availability of libraries with high quality public access services translates into a significantly higher valuation of public access in libraries by users *and* non-users (compared to cybercafés and telecenters). Conversely, in countries like the Philippines whose citizens are active members of the overseas workers community, cybercafés help to bridge the communication gap, facilitating social cohesion by keeping families connected. Likewise, in Brazil and South Africa, although users have alternative forms of access to ICTs (home internet access in Brazil, mobile internet access in South Africa), both libraries and cybercafés support specific user needs by addressing technological and other limitations of existing private access. In Lithuania, while cybercafés are a dying breed due to increased home internet access, libraries continue to thrive suggesting that they meet unique user needs and have greater staying power.

Based on all indicators to date, it can be said that many low and middle-income countries are at relatively early stages of ICT penetration. Moreover, the rates of adoption are not comparable to those seen in advanced economies in the past two decades. It may take decades for some countries to reach high levels and quality of home connectivity, thus, **public ICT access will remain a critically important service**, and as discussed above, is likely to continue to have relevance even when higher connectivity has been achieved. Finally, some of these countries may be developing their own distinctive modalities of ICT use, reflecting cultural norms, communal attitudes, or practical considerations. These modalities may emphasize the value of rationing use, sharing workstations, or learning collaboratively, for instance. Both of these trends – the rate of adoption and emergence of distinctive modalities – need to be monitored over time, for governments, donors and private investors to adjust policies to the changing needs and practices in the public access landscape. Critically, the broader national environment needs to be addressed in parallel with the rollout of public access, to enable this resource to deliver expected results.

The findings and conclusions of the study are discussed in more detail below.

What are the social and economic impacts of public access to ICTs?

The research shows that public access has a variety of impacts, including first-order effects (digital inclusion) and second-order effects (social and economic impacts).

Digital inclusion is the fundamental first-order effect of public access provision and use. As computer and internet technologies are increasingly crucial resources for functioning in today's society, it is generally accepted that populations lacking access to ICTs are disadvantaged in the global economy. The digital inclusion impacts of public access enable populations to overcome limitations (such as poverty and lack of digital skills) that hamper their ability to access and make productive use of ICTs.

The study identified three levels of digital inclusion from the data. *Technology access* refers to the expansion of physical access to computers and internet technology. The data show that, for large portions of society, this goes to the heart of the value they attach to public access. The study found that 48% of users surveyed identified lack of access to ICTs as their main reason for patronizing public access venues (33% for the internet and 15% for computers); and over 50% said that their use of computers would decrease if public access venues were no longer available. For many, public access also provided their first encounter with computers and the internet. 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* flows from technology access, as computers and the internet are gateways to a wealth of information, including education, entertainment, and employment and business opportunities. The data show that users take advantage of public access venues to retrieve information that might not otherwise be readily available to them, and over 90% of respondents looking for information usually found what they were looking for. *Development of ICT skills* is a critical third impact area of public access, both through providing training and support services and by providing a space for hands-on exploration of digital technologies. A majority of users said that public access venues were the most important places for development of their computer (40%) and internet skills (50%). Finding an environment that is responsive to their level of need for support in using ICTs was an important factor for both novice and experienced users. In several cases, the proportion of users identifying these digital inclusion benefits was higher for people of lower socioeconomic status (based on personal income and educational level).

Social and economic impacts are the second-order effects of providing digital inclusion through public ICT access. From the perspective of users, using computers and the internet at public access venues delivers benefits that touch on multiple aspects of their livelihoods, including Culture & Language, Education, Employment & Income, Governance, Health, and Communications & Leisure. Over 50% of surveyed users reported positive impacts in their *communication with family & friends, meeting new people, education, time savings*, and *access to employability services*. Similarly, 25%–40% experienced positive impacts on *financial savings, access to government information & services, local language & culture activities, income*, and *sending or receiving remittances*. In every area of activity, it is clear that the availability of public access enables users to participate in aspects of personal, social, economic, and civic life that are important or relevant to them.

These impacts are not limited to users who depend on public access for ICTs. The evidence shows that former users, and people who have alternatives to public access, also enjoy these benefits. Former users indicated that public access had been important to them in the past: for 28% as their first use of a computer, and for 35% as their first use of the internet. This past use evidently provided preparation for participation in the information society through private ICT access. Moreover, people with other means of accessing ICTs (at home or work, for example) still found compelling reasons to visit public access venues, such as for better equipment or other resources. Finally, non-users reported that the use of public ICT access by their family and friends indirectly benefited them as well, in a broad range of areas. Ten percent had asked someone else to use a venue on their behalf in the past, and more than two-thirds (68%) reported positive impacts from their family/friends' use of public access — especially in the areas of *maintaining communication with family & friends* (63%), *education* (51%), and *meeting new people* (45%). Although direct users were more likely to report positive impacts, such indirect uses and outcomes are not inconsequential.

Overall, the indications of negative impacts were relatively limited. The most prominent related to financial and time expenditures (reported by 10%–20% of survey respondents), perhaps reflecting the cost in time and money of using public access venues.

In essence, public access enables change in personal, social, economic, and other realms of life, by providing the technological and human tools (basic or advanced) that open up the information society to individuals. Public access supports the development of the knowledge and skills needed to navigate the digital world, and through that the real world. Public access provides users with benefits in a variety of ways: supporting communication and social interaction; supporting information-seeking on diverse topics; supporting service-seeking in multiple areas of the economy; improving efficiency and reducing transaction costs to get things done; and supporting the pursuit of leisure activities.

What is the magnitude of public access impacts?

The second topic of interest to the Global Impact Study was the extent of the impacts of public access: How big are public access impacts? How can they be measured? The approach adopted was to measure magnitude of impact by the percentage of people experiencing a particular impact in a particular area, noting whether it was positive or negative, or non-existent. This, in researchers' judgment, was more feasible than trying to obtain a numeric measure of the change in a particular area of an individual's life as a result of using public access. The survey results show that the magnitude of public access impacts varies depending on the population and the domain involved.

Public access impacts, in that respect, are not judged as big or small, but rather as either broad-based and cross-cutting or targeted. In some areas, public access impacts were quite expansive, spanning all sections of the population — young and old, urban and non-urban, male and female, employed and unemployed, and so on. This especially related to the Education and Communications & Leisure domains, where over 80% of users, and over 50% of non-users, indicated positive impact from their own use or their family/friends' use of public access. In other domains — Culture & Language, Employment & Income, Governance, and Health — public access impacts were more narrowly focused on specific populations (e.g., health issues for older populations). For these populations, too, the impacts were overwhelmingly positive.

The research into specific goals that users pursue at public access venues found very high levels of goal achievement, indicating that the resources available at public access venues are effective in enabling users to do the things they want to do. A self-assessment showed that over 90% of users reported overall success in meeting their goals (searching for information, finding information, and taking action or experiencing some result).That is not to say that public access venues are perfect in their service delivery; the study cannot discount the influence of users' own motivation and personal abilities, neither can it determine whether users are justified in believing that they have achieved specific goals.

The study also compared non-users' perceptions of positive (indirect) impacts from public access usage versus impacts from their (direct) use of other alternatives for information and communication. The results suggest that having *direct* access to ICTs and related resources makes a difference. Non-users experienced positive (indirect) impacts from public access at a lower rate than positive impacts from their (direct) use of other types of information and communication resources.

What is the relationship between the costs and benefits of providing, and using, public access ICTs?

The study aimed at evaluating costs and benefits from the perspective of both public access service providers and public access users. Because of the difficulties of collecting reliable cost data from public access venues, the results on the user perspective are more reliable. Using the travel cost methodology, the study captured the value users place on public access in terms of the amount they pay to reach a public access venue. In purchasing power parity terms, this amount ranges from annual expenditures of

$15[3] in Ghana to $83 in Brazil. It appears that *any* form of access trumps the features of any particular public access model: where users do not have a variety of options, they are prepared to pay to travel to whatever is available (library, telecenter, or cybercafé). However, it is notable that in Chile and the Philippines, libraries were more highly valued than other venue types, as users were willing to spend more to reach a library than a cybercafé. An in-depth study in Chile provided confirmation: both users and non-users voted their highest support for libraries by indicating a willingness to pay about $49 to keep libraries open, compared to $16 for telecenters and $7 for cybercafés.

Yet another lens applied to derive an indication of the social value of public access was to compare the extent to which non-users of public access would be willing to pay to keep public access available to people *other than themselves*. The results point to an extensive reach, as non-users in the five survey countries indicated willingness to pay ranging from $2 (Bangladesh) to $101 (Philippines) to keep public access venues open.

Contextualizing public access impacts

The detailed findings on public access to ICTs lead to some general conclusions about the role, impacts, and long-term potential of public access.

1. Is public access still relevant?

The evidence suggests quite clearly that public access venues play a critical role in extending the benefits of ICTs to large sections of the population, despite the expansion of mobile telephone access. The vast majority of public access users in fact possess mobile phones, but this form of private access does not appear to have lessened the importance of public access venues. A survey of youth mobile phone users in South Africa found that they also value the affordances provided by public access venues. Public access is part of a broader ecology of information and communication resources. In addition to mobile phones, people meet their information needs variously through TV, radio, and print materials, as well as directly from health professionals and others, navigating the range of options in ways that best meet their needs. Public ICT access is remarkable for its staying power and lasting significance.

2. Is public access to ICTs a substitute or a complement to home access?

A large number of public access users do have computers and internet connections at home. In Brazil, for example, the internet penetration at home among venue users was 40%, compared with the 24% national average (in 2009). 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. What attracts people to public access, even when they can use ICTs from the comfort of their home? Users cited several reasons: better equipment, faster connections, access to infomediaries and peers either for help or a sharing experience, competition from home members, the benefits of socialization, and more. On the other hand, data from the non-user survey show that about 75% of former public access users stopped going after they gained private computer and internet access (not mobile phone based).Thus, while some individuals stop using public

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[3] All financial data in this report is expressed in $USD.

access venues as a result of private access, a large number of people with home access are also regular public access users.

3. Uses and impacts by priority populations

The goal of most public and donor funded initiatives is to reach specific priority populations which are perceived as disadvantaged in some way: low socioeconomic status, unemployed, at-risk youth, rural residents, minorities, women, etc. This study therefore focuses on these groups. The study found that, in most instances, their experiences inside public access venues are on par with their more advantaged counterparts. At the same time, the evidence indicates that most public access users are of middle socioeconomic status, urban, male, and young. This fact is often raised as a point of criticism. However, a strong case can be made that expanding public access to ICTs for all demographics will benefit a country over the long term, especially when enhanced with such services as ICT training, distance learning, and job placement. Indeed, the relative youth of public access users is of key importance, since the youth are a critical resource for national progress. From another perspective, for young people public access venues may provide a safe and supportive environment to engage with technology and each other.

4. Uses and impacts in priority domains

Most public and donor initiatives promote the use of public access facilities for specific domains such as Education, Governance, and Health. These are considered "productive" uses, in contrast to more casual uses such as Communications & Leisure. The data confirm that activities in the Communications & Leisure domain in fact dominate public access usage, both in numbers of people and in frequency. This trend is generally seen as a failure of public access to promote desirable user behavior. However, while the high popularity of some activities may signal high importance, low popularity does not similarly signal low importance. Accessing critical health information is likely quite important to those who use public access for this purpose, even if they are few in number. Neither can frequency of use be equated with importance. A more appropriate gauge may be whether an activity is *routine* or *episodic*. Routine uses are those pursued in nearly every visit to a public access venue, such as online communications and leisure activities. Episodic uses are activities that are pursued occasionally, whether a few times per year (e.g., accessing government services) to less frequently (e.g., looking for a new job).

This understanding of usage patterns helps to contextualize the large proportions of "no impact" responses reported in the project surveys, which represented the respondent's non-use in the specific domain. Non-use appears to be related to whether a particular area of activity was relevant to the user, or was even feasible in the user's context.

Finally, the findings of this study challenge the notion that communications and entertainment activities are frivolous and do not lead to productive outcomes. The results show that people may accomplish instrumental tasks via email and social networks. Playing games and engaging in other leisure pursuits may build important computer skills that are transferable to the workplace. This has important implications, both for public policy, when judging the utility and value of this activity, and for the operators of public access facilities, with regard to restrictions that may be placed on these activities. Moreover, the value of social networks is increasingly evident. From job referrals to political uprisings, the latent value of social ties comes into play when needed, enriching the lives of people and their connections to their society.

5. Does venue type matter?

The driving motivations for individuals' use of public access venues are having access to the internet and to computer equipment. All venues make an effort to cater to their users' needs: cybercafé staff, according to the in-depth qualitative examination, went to similar lengths as library and telecenter staff to meet people's technical and information needs. But other factors can also be important to certain users and populations. By a factor of six to one, libraries and telecenters were more likely to offer in-house training than cybercafés. For introducing and familiarizing new users with ICTs, this may carry great significance for many countries, both those at lower levels of connectivity and those that have sizeable non-user populations (e.g., elderly, rural residents). The Bangladesh data further illuminate the critical role that publicly and donor supported venues can play. Nearly half of the respondents avail themselves of staff assistance every time or most of the times they visit a public access venue. In rural areas, public access would be outside the reach of most without the presence of telecenters. In terms of gender, too, the data suggest that libraries and telecenters do a better job of welcoming females. Looking at specific domains, the study also points to differences. Relative to cybercafés, larger proportions of library users report positive impacts in such areas as Culture & Language, Governance, and Health. Of course, it remains to decision makers in each country or region to judge whether the value added of libraries and/or telecenters justifies the resources required to support these venues.

6. Measuring public access impacts

In the realm of ICTs in general, and public access in particular, it is notoriously difficult to pin down evidence of social and financial returns in unambiguous ways. A central argument relates to how one can make causal linkages between what happens at a public access venue and any subsequent changes that occur in a user's life. In the debate about *attribution* versus *contribution* as a theory of change, this study gives some support to the contribution viewpoint. It is credible to conclude that public access contributes to the accomplishment of specific goals, though it cannot necessarily be said to cause particular impacts. This is not an indictment of public access; the contributory role is critical and provides a foundation for continuing benefits over time. It is important, however, when considering the impacts of public access, to adopt realistic expectations and to recognize the true value of the services these venues provide. A second point, related to realistic expectations, is that across all categories of use and domains of impact, the evidence shows that country context matters: research results are not uniformly generalizable to other countries. Nevertheless, other evidence is coming together to suggest that countries with similar socioeconomic environments may produce similar results. An additional question remains about the timeframe for trying to identify impacts: How long should public access venues be in existence before impacts are expected to occur and become measurable?

Conclusion

The impacts of public access cannot be measured in a generic fashion. Different modes of venue setup, specific ranges of facilities and services, the heterogeneity of user populations, and the level of the information society in a particular country make it imperative to design impact assessments for the appropriate levels and targets of analysis — to distinguish, for example, between basic technology access goals and improving maternal health care.

For a meaningful economic and social livelihood, people need multiple capabilities: a means of generating income; opportunities for formal and informal learning; the ability to maintain their health and well-being; access to relevant corridors of power; the ability to exercise informed democratic rights and obligations; and the ability to participate in the production of their cultural heritage. Add to this the

resources to build, maintain, and enhance social connections, with potentially far-reaching implications for livelihoods and well-being. Finally, there is the human importance of leisure — the ability to play, laugh, and pursue one's personal interests or desires. These are all components of a good quality of life.

Arguably, what public access venues facilitate is the ability to *pursue* these ends. The broader social, economic, and political context determines the extent to which exercising these abilities translates into specific social or economic indicators, such as increase in income, acquisition of a job, admission into college, reduction of disease prevalence rates, or preservation of culture. Measuring the precise contribution of public access to these indicators, relative to other local and national resources, is a complex task, beyond the scope of the Global Impact Study. The study's survey data are openly accessible, so that others may avail themselves of these data to explore the issues raised here, and more. The results compiled here help to shed light on the public access phenomenon and to inform decision-making processes regarding the potential contribution of public access as a factor in meeting policy objectives.

Recommendations

This report makes recommendations based on the study's findings for these three key constituencies — government and donor organizations, leaders and practitioners of public access programs, and researchers. The summarized recommendations are:

Governments and donor organizations

Governments, multilateral agencies, foundations, and other public and private organizations are the primary supporters of the public access model. Many of these entities are currently investing significant resources in public access, others have done so in the past, and still others are contemplating entry into this field. The following recommendations seek to inform the deliberations, decisions, and implementation strategies of organizations across this spectrum.

1. **Support the wide availability of public access venues**

   Public access is a valuable resource for countries worldwide. The research finds that public access is filling multiple needs for all populations groups, needs that are not being met by mobile phones or other information and communication resources. Governments and donor organizations should continue to make public access availability a strategic consideration, particularly in rural areas and where widespread private access is not feasible in the near future.

2. **Use existing infrastructure, such as libraries, for public access**

   When considering investments in public access, decision makers should scan the landscape in the area to see what infrastructure already exists. In most countries, this infrastructure is found in libraries and cybercafés. This research uncovered that, in all of the surveyed countries but Chile, libraries are largely untapped sites for public access. Equipping libraries for public access provision makes sense, particularly since the data shows venue differences in user profiles, activities, and impacts that favor libraries.

3. **Channel domain-specific information and services**

Despite numerous efforts in recent years that have focused on developing and distributing domain-specific ICT applications in health, agriculture, education, and other areas, large gaps still exist in awareness and skills needed to use these applications, services, and online resources. The evidence shows that public access venues are important for users with needs in these areas, and that these users may be unaware of these resources, even if available at public access venues. Decision makers and creators of these domain-specific resources can leverage the reach and use of public access venues to deliver and increase uptake of these resources and information.

4. **Embrace communications and non-instrumental uses, such as games**

It is clear that venue users devote a significant amount of time to communications, social networking, and other supposedly "non-productive" uses of technology. Rather than considering these uses as detrimental, use in these areas should be supported by public access. This research shows that these uses in fact build skills and support instrumental aims. Increasingly, people get their news from social networking sites, use a variety of online applications to share, collaborate, learn, and create, and build technology skills through leisure activities.

5. **Assess performance against realistic measures**

The performance of venues should be assessed based on a well-grounded appreciation of what public access can and cannot do. It is important to acknowledge the critical contribution public access venues make at the most basic level: providing computer and internet access and fostering the development of digital skills. This research suggests that it is necessary to re-think how to assess venue uses, especially for categories of use that are episodic (e.g., looking for a job) rather than routine (e.g., email). The data show that different people have different needs, and their needs vary at different times in their lives. The value of public access in priority areas is that the venues are available when individual needs arise. The use of episodic services cannot be usefully compared to uses that are routine. Additionally, the performance of venues should be assessed based on a well-grounded appreciation of what public access can and cannot do.

Public access practitioners

Public access practitioners — librarians, infomediaries, and venue staff — operate on the front lines of the public access phenomenon. Their capabilities and modes of service delivery, along with the affordances they enable, can directly influence how users and the general public respond to public access, and thus the level of impacts.

1. **Adopt a flexible approach to rules**
   While some limits on users' behavior are necessary to ensure respect for people and property at public access venues, some restrictions (e.g., on social networking or gaming) can inhibit some of the behaviors that are most likely to lead to development outcomes. Public access practitioners should be sensitive to context — the needs of users, societal trends, new knowledge regarding useful activities — while making adjustments to policies as appropriate to fit the situation. Public access venues should respond and be flexible to emerging needs.

2. **Embrace mobile phones**
   Mobile telephony presents opportunities for venues to leverage or enhance their services. The study results reveal that mobile phones currently do not pose a threat to the relevance of public

access facilities. To the contrary, there are non-disruptive forms of mobile phone use that, if allowed, could heighten the quality of a user's experience in a public access venue — such as printing directly from phones, accessing wireless networks on phones, or reserving a computer via SMS.

3. **Do not rule out fees**

This study shows that users are willing to pay for ICT resources available at public access venues. Venues facing sustainability pressures may want to consider a fee structure as an option for supporting their activities. However, a decision to institute fees should take into account the socioeconomic status of any priority groups of users or potential users, who may be unable to pay for access, as well as the range of alternative ICT access options.

4. **Attend to venue design and environment for infomediation**

There are a number of features of public access venues that attract users and encourage productive behavior, such as knowledge workers (librarians, other trained staff) and venue configuration. The broader function of "infomediation" creates the appropriate environment for users to operate based on their unique capabilities and needs, a critical factor in the user experience. Facilitating interaction between users who are drawn to public access venues for the physical space to be with friends or colleagues requires attention to how the space is configured, including the placement of computers (in open spaces or private booths).

5. **Make users aware of content availability in priority domains**

The study shows that users may not engage in a particular activity at a public access venue because they "did not think of it." This suggests that they are not aware of the relevant resources, or they perhaps assume that the venue has no resources in that area. Practitioners should ensure that they publicize the types of resources they have available, so that, as the occasion arises, users would have public access in mind as an option for addressing specific needs.

Researchers

A primary aim of this project is to re-invigorate debate about the value of public access and to spur new research. These recommendations include specific topics for possible exploration, as well as other opportunities and reflections on new research directions.

1. **Build on methodological lessons.**
   Much work remains to be done to develop and strengthen methodologies for conceptualizing, identifying, and measuring public access impacts. In pursuing this, the project team offers the following considerations:

   - Country context matters enormously, in particular regarding overall connectivity, presence of different models of public access, extent of public access use (current and historical), and public policies. This variability of context needs to be taken into account when attempting to produce generalizable findings, with challenging implications for methodological and analytical decisions.

- Public access exists within an ecology of information and communication resources and practices. This ecology needs to be accounted for at the research design phase as well as when analyzing and interpreting data. Rather than primarily seeking to measure "impacts," a more productive approach to evaluating the social or economic value of public access could be to explore how public access venues fit into this information ecology.

- In developing impact indicators, care should be taken to ensure that venues are not being assessed in terms of unrealistic objectives. The study has attempted to clarify an important distinction between digital inclusion impacts and other types of impact, including social and economic impacts that may be only indirectly associated with the use of a public access venue.

- Collecting financial information from diverse public access venues is a difficult challenge. Rather than large-sample survey methodologies, a more viable strategy would be an in-depth method, involving smaller samples of venues, to cooperate with respondents in producing accurate cost data.

2. **Conduct deeper analysis on questions raised by this report.**

The project team was inevitably limited in the range of questions analyzed in this study, leaving a plethora of other questions for future research. Researchers can make use of the project's inventory and survey data to enable analyses such as:

- Uncovering the conditions under which impact occurs, linking user outcomes to such variables as a venue's technical infrastructure, rules, knowledge workers, and location
- Further exploring specific user populations, such as youth, women, unemployed, etc.
- Conducting geographic information systems (GIS) analysis, using the project's inventory of 65,000+ geo-located venues
- Further analyzing past impacts and indirect impacts of public access

3. **Explore open inventory and survey data**

The Global Impact Study has made *all datasets and other resources* publicly available. Datasets, instruments, codebooks, methodological notes, and other resources can be found on the project website: www.globalimpactstudy.org.

Chapter highlights

This section summarizes the research design and provides snapshots of the main research findings as presented in Chapters 2–8 of this report.

Chapter 2: Conceptual Framework & Research Design

The research presented in this report was conducted in multiple national contexts, deploying various complementary methodologies. The core focus was on five countries (Bangladesh, Brazil, Chile, Ghana, and the Philippines), with complementary studies in three additional countries (Botswana, Lithuania, and

South Africa). These countries span three continents and represent a range of economic development levels, information technology penetration levels, and public access histories and practices.

First, in each of the five core countries researchers conducted an *inventory* of public access venues to establish the contours of the public access phenomenon.[4] Second, after drawing a representative sample of venues from the inventory in each country, researchers conducted *three kinds of surveys*: a survey of 1,250 venues operators; a survey of 5,000 users in these venues; and a survey of 2,000 non-users in the areas surrounding public access venues. These extensive surveys illuminate the patterns of public access use and some resulting outcomes. Third, *seven in-depth case studies* were conducted to examine several salient or contested aspects of public access venues:

- *Infomediation* available through public access venue staff (in Bangladesh, Chile, and Lithuania)
- *Shared use* among public access venue users (in Ghana)
- *Gaming and non-instrumental uses* (in Brazil)
- *Interpersonal communication* (in the Philippines)
- *Mobile internet* (in South Africa)
- *Cost-benefit analysis* (in Chile)
- *Livelihood sustainability* (in Botswana)

STRENGTHS OF THE RESEARCH DESIGN
- Achieves both breadth and depth of analysis through use of multiple methods: multi-country surveys and country-specific case studies
- Targets the outcomes of public access use (as opposed to ICT use in general)
- Adapted to individual country context
- Accounts for indirect uses and impacts, an often overlooked component of public access assessments

WEAKNESSES OF THE RESEARCH DESIGN
- Complexity
- Survey methodology not applied uniformly across all countries, presenting some analytical challenges
- No common theoretical frame across the different methods
- Depends primarily on self-reported impacts

Chapter 3: Public Access: Landscape & Realities

The landscape of public access venues is diverse, with both common and unique features across the eight countries in terms of the types and operations of the different venue models.

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[4] An inventory was also conducted in Lithuania.

- Countries with higher connectivity (e.g., Brazil and Chile) have a higher density of venues compared to countries with lower connectivity (e.g., Bangladesh and Ghana).
- In every country, cybercafés are the dominant form of public access, far eclipsing the numbers of public libraries and telecenters. In general, cybercafés offer similar services across the eight countries.
- Libraries and telecenters are more prominent in certain countries than in others, and may provide a wider range of general and specialized services (e.g., training and job placement services).
- The distribution of venues is skewed in favor of urban centers, particularly for cybercafés.
- Libraries and telecenters overwhelmingly belong to larger organizations and networks, whereas cybercafés are almost always independent entities.
- Cybercafés are on average bigger and offer a wider range of layout configurations.

The composition of public access users is diverse, with youth, adults, males, females, workers, and others represented in varying degrees, depending on the country and/or type of venue.

- The largest user population across all countries is youth in the 16–25 age group.
- Public access users are more educated than the general population, across all countries.
- Users generally come from families with lower to middle incomes, though this study largely represents people from poor families (especially in Bangladesh, Ghana, and the Philippines).
- For large proportions of the population, public access constitutes the only option for computer and internet use, with variation across countries.
- Female users are still a minority. High connectivity countries such as Chile appear to have higher proportions of female users but they were hard to find in other countries during the data collection process. According to venue operators in the five survey countries, female users range from 10%–48% of unique visitors. Library operators reported the highest proportion of female visitors (47%), compared to 28% for cybercafés and 23% for telecenters.
- The vast majority of users are systematic users, for whom public access is a defining feature of their daily or weekly routines, across all countries.
- Nearly 100% of users have a mobile phone, with wide variation in mobile internet use.

Chapter 4: Digital Inclusion: Opening Doors

First-order impacts are observed in the area of digital inclusion — expanding access to technology and information resources, and supporting the development of ICT skills.

- For more than half of all users, public access provided their first ever contact with computers and the internet. The proportion was even higher among lower socioeconomic groups and female populations.
- Public access venues were the only source of access to the internet for one-third of users, and over half would experience a decrease in their use of computers if public access venues were no longer available.
- Public access venues were the most important place for the development of computer skills (40%) and internet skills (50%), far outscoring schools and the home. The figures were higher for people with lower personal incomes and lower educational levels.

- Users see public access venues as places where a broad range of information needs can be met. About half of all users sought specific information on the day of the survey, especially in libraries. The top three areas were education, entertainment, and employment and business opportunities.
- Over 90% of users found the information they were looking for.
- Overall, more than half (53%) of all users indicated that staff knowledge and helpfulness is an important criterion for selecting a public access venue. However, the rate of seeking staff assistance varied. In Bangladesh, a country with a high proportion of novice users, 43% sought staff assistance every time or most times they visited a venue. The next highest country was Ghana at about 14%; the others were all under 10%.

Chapter 5: Beyond Access: Social & Economic Impacts

Social and economic impacts are the second order effects of using public access in the domains of Communications & Leisure, Culture & Language, Education, Employment & Income, Governance, and Health. Significant impacts are reported across 13 categories of use in these domains and for all users, especially population groups that are of priority interest in international development.

- Usage in specific domains was highest for Education (66%) and Employment & Income (42%), followed by Health, Culture & Language, and Governance (20%–25%).
- Over 50% of users reported positive impacts in *communication with family & friends, meeting people, education, pursuing leisure activities, pursuing interests & hobbies, time savings, and access to employability services*.
- Between 25% and 40% of users experienced positive impacts on *financial savings, access to government information & services, language & cultural activities, income,* and *sending or receiving remittances*.
- Relatively low proportions of users reported negative impacts, and these tended to be associated with expenditures of time or money: *financial savings* (20% of users), *time savings* (12%), and *income* (10%).

 Further analysis provides more insights. With regard to activity:

- Among those who used a public access venue in the last 12 months for a particular domain, over 50% reported positive impacts (from 60% in Employment & Income, to over 90% in Education).
- Across all domains, approximately 90% of users were able to accomplish information- or service-related tasks. This was captured through a self-assessment focused on a three-part sequence of actions: searching for information, finding information, and taking action.
- Examples of goal achievement (final step of the sequence) included: applying for a job, earning more money for business, applying for school admission, better managing an illness, making changes to dietary habits, completing an online government service, and participating in a local cultural event.

Use and impact by venue type varies:

- Across all domains, library and cybercafé users showed a higher frequency of use than telecenters users.

- Use in the domains of Culture & Language, Governance, and Health was higher in libraries than in the other two venue types.
- Larger proportions of library users reported positive impacts in several categories in the specific domains targeted by development initiatives, including: *education*, *time savings*, *access to government information & services*, *local language & cultural activities*, and *health*.

Although the data on users shows a profile of younger, relatively well-resourced males, the findings on impacts for other user populations offer important evidence and insights that moderate the picture presented by the overall user profile.

- Unemployed users experienced positive benefits in similar proportions to employed users, and in one category (*communication with family & friends*) the unemployed were more likely to report positive impacts.
- Similar proportions of people below and above the poverty line experienced positive impacts across the 13 impact categories examined.
- Larger proportions of unemployed users (both below and above the poverty line) reported positive impacts in *education* (80%, compared to 71% for employed users). Higher proportions of employed-below-poverty-line users reported positive impacts, compared to employed-above-poverty-line users (43% versus 32%).
- Perceptions of positive impact rise as education level increases.
- Overall, females benefited similarly to males, although more male users perceived positive impacts in the Employment & Income categories, while more female users perceived positive impacts in the Communications & Leisure categories.
- Higher proportions of older users tended to experience positive impacts in the primary development domains (such as Education and Employment & Income) compared to younger users, who were more likely to report positive impacts in the Communications & Leisure categories.
- Working-age users report positive impacts in the employment-related activities, and older adults were more likely to report positive impacts in the *health* and *government* categories.
- Rural users, based on an analysis in Bangladesh, trailed their urban counterparts in terms of usage across most domains. However, when controlling for such factors as computer experience, frequency of use, and venue type, the differences in impact largely disappeared.

The role of Communications & Leisure is given special attention. It is examined as a domain, as a means to achieving impacts in other domains, and as a contested issue, reflecting the widespread view that communication and *leisure activities* constitute frivolous uses of public access facilities.

- Fully 94% of users reported that engaging in Communications & Leisure activities at public access venues had improved their overall ICT skills.
- Results from computer-based exercises in Brazil 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 an alternative pathway to gaining digital literacy.
- There was a strong correlation between frequency of engaging in Communications & Leisure activities and positive impact across several categories: *education*, *time savings*, *access to*

employability resources, *local language & cultural activities*, *health*, and *income*. Two categories that did not follow this trend were *financial savings* and *sending or receiving remittances*. Public access venues played an important role in enabling communications among dispersed family members, as in the study of overseas Filipino workers, although private home access was preferred.

- Email and social networking sites were *the most* important online resource (over websites) for 12%–37% of users across the 13 impact categories.
- Results of the study of South African teens showed that mobile internet was not a substitute for public access. Public access and private mobile offered different affordances, with public access venues supporting the development of digital literacies and mobiles supporting everyday social literacies.

Chapter 6: Hidden Impacts: Non-users

Assessments of public access impacts often neglect to examine non-users. This study found strong evidence that public access has impacts reaching beyond those who have directly used public access venues at any point in time. Although indirect impacts were almost always evident in lower proportions than direct impacts, they constitute an important element of impacts.

Reasons for non-use were related to user characteristics rather than venue features.

- The most common reasons for non-use were that respondents did not know how to use computers, had computer access elsewhere, or did not have time to visit public access venues.
- Mobile phones were not a factor contributing to people's non-use of public access computers. Despite high levels of mobile phone ownership (94%), only 4% of non-users said they did not use public access because they could access the internet on a mobile phone.

Public access was an important past resource for former users.

- Of former users, 28% had first used a computer at a public access venue, and 35% first used the internet at a public access venue.
- Computer non-users in particular considered public access venues to have been the most important locations for development of their computer and internet skills (about 40% each).

There were fairly high levels of proxy use (people using public access on another person's behalf).

- Depending on the domain of activity (Education, Governance, Health, etc.), between 10% and 23% of public access venue *users* reported using a venue on another person's behalf.
- Ten percent of *non-users* said they have asked someone else to use a venue on their behalf. These non-users were also more likely to report positive indirect impacts from public access, compared to those who had not ever asked someone to use a venue on their behalf.

Chapter 7: Looking Closer: Salient & Contested Issues

Five in-depth studies examined issues which often stand out in the academic and general discourse on public access, and which tend to generate controversy about the usefulness and impact of public access.

- **Sharing: Understanding and rethinking shared access.** Analyzing collaborative, co-present sharing in two Ghanaian cybercafés, this study found that public access enables different forms of sharing and collaboration among patrons, ranging from the most simplistic (asking a café employee a quick question) to more formalized (working together around a single computer) to fleeting and voyeuristic (glancing at a stranger's computer screen). Patrons highlighted the learning benefits of working together, rather than the cost savings, as a motivation to use public access venues.

- **Infomediaries: Brokers of public access.** Staff who serve as intermediaries between users and ICT resources are an important feature of public access venues. This study compared infomediary practices and user perceptions in Bangladesh, Chile, and Lithuania, and found that the ability of infomediaries to empathize with public access venue users is as important as their technical skills. Non-profit and for-profit venues did not differ significantly in how they encouraged staff empathy: in both cases, empathetic infomediation is simply good business.

- **Non-instrumental: The value of non-instrumental computer use — skills acquisition, self-confidence, and community-based technology teaching.** "Non-instrumental" activities, such as gaming and social networking, contribute to users' acquisition of computer skills that are associated with greater employability. Non-instrumental activities figure prominently in users' introduction to computers, and while respondents' computer skills grew with their overall computer use, the activity mix made little difference: "gaming" leads to similar computer skills as "working."

- **Interpersonal: The impact of cybercafés on the connectedness of children left behind by overseas Filipino workers.** Interpersonal communication activities in public access venues matter to family connectedness within Filipino families where parents are working overseas. Internet access increased family connectedness. Frequent and convenient access made a greater difference: private access in the home or via a child's mobile phone appears vastly superior in this regard to access in a public access venue.

- **Mobile: Public access, private mobile – the interplay of shared access and the mobile internet for teenagers in Cape Town.** Mobile phones and public access computers are not substitutes for one another. Each corresponded to distinct activities and information behaviors, leading to different social, academic, or professional practices. Public access users have developed elaborate, fine-grained practices combining public access computers and mobile phones, taking best advantage of the complementary aspects of each.

Four common themes emerge across these in-depth studies:

- Public access is not simply a transient substitute for private access, nor one that is always inferior to private access, but public access and private access are often complements. Which is preferred for a given activity depends on multiple factors, ranging from timing and circumstances to the user's particular purpose. Such preferences vary over time even for a single individual.

- Public access venue users have developed complex, fine-grained practices to best take advantage of the opportunities each access option offers. They pursue one or several access options in combination, either individually or in concert with other users.

- Public access plays a critical role for vulnerable populations. These are the places where many among the youngest, poorest, and most marginalized populations first encounter information technology, and they serve as the primary avenue through which they develop ICT skills and get assistance in their journey toward digital literacy.

- Public access opens multiple alternative pathways to digital literacy. "Learning" is a key reason to use public access venues, not necessarily through formal classes but to learn by doing, by watching others, and by playing, and to learn through communication with others or the mentorship of thoughtful infomediaries. Public access venues represent a crucial laboratory for the development of non-traditional paths to digital literacy.

Chapter 8: Benefits & Costs: How People Value Public Access Venues

The cost-benefit methodologies sought to capture the value public access users and non-users ascribe to public access venues by examining (1) how much users paid to reach a public access venue, and (2) how much non-users were willing to pay to keep public access venues open for other people's benefit. From the user perspective, the travel cost method provides an expression of the value users place on public access in the amounts they are willing to, and in fact do, pay just to reach a public access venue.

- In purchasing power parity terms, users incurred annual expenditures ranging from $15 in Ghana to $83 in Brazil to travel to a public access venue.

Where people had choices, public libraries were highly valued.

- In Chile and the Philippines, users were willing to forgo more to reach a library than a cybercafé. Both users and non-users in Chile voted their highest support for libraries, indicating willingness to pay about $49 to keep libraries open, compared to $16 for telecenters and $7 for cybercafés (in purchasing power parity terms).
- Where users did not have a variety of options, they were prepared to pay to get to whatever type of venue was available.

Non-users were willing to pay for other people to have public access to ICTs.

- Non-users indicated a willingness to pay from $2 (Bangladesh) to $101 (Philippines) to keep public access venues open. This is an important indicator of the social value of public access.
- There was overwhelming support for libraries in Chile, with a mean individual valuation of libraries around $57, compared to $20 for telecenters and $8 for cybercafés.

1. Introduction

Millions of people around the world rely on public access venues — libraries, telecenters, and cybercafés — for computer and internet access and services. Public access venues allow people who may have no other means of access to participate in the information society, whether to obtain health information, learn computer skills, communicate with friends and family, or play games. Because having the skills and means to access the internet is essential in a world increasingly dependent on online resources and tools, a global movement developed to equip communities with public computing facilities. Most of these venues are commercial, including the internet cafes, Cabinas Publicas, LAN houses, and other types of paid access that are collectively referred to in this report as cybercafés. Many others, especially in rural and other underserved areas, are supported by governments, development agencies, and foundations. These are the libraries and telecenters. Altogether there are countless public access venues worldwide, becoming a visible feature of most cities and towns and a significant means by which a large population of the world accesses ICTs.

The growth of public access venues around the world, particularly with the support of governments and other donors, poses a number of important questions: What is the impact of these venues on people's lives? Do people measurably benefit, and how can this be determined? And do any benefits justify the investments necessary to provide this access? Finding answers to these questions is the purpose of this study.

This is the most comprehensive study to date on this topic. The research was undertaken during five years, from 2007 to 2012, in eight countries, involving over 35 research partners at leading universities and research institutes around the world. This report represents the first summary output of the research.

Background

The importance of this topic stems from a seeming paradox. On the one hand, in many countries the public access sector is vibrant. Existing programs continue to be supported and expanded, and new programs are being launched. The public investments are significant, especially in countries that want to emulate others' successes. The cybercafé sector continues to thrive as well.

On the other hand, in some quarters, especially among development agencies, interest in public access has waned considerably, largely due to changes in the field of information and communication technologies and development (ICTD), even since the inception of this study in 2007. The reasons for this decline are multifold.

First, this period marks a shift in priority from general purpose access initiatives to more domain-specific efforts in the fields of health, agriculture, and education, among others. The increasing mainstreaming of ICTs is reflected in changed funding priorities that focus on more targeted applications.

A second reason is the explosion in mobile telephony. In 2007, there were 3.4 billion mobile subscriptions globally, including 2.1 billion in the developing world (ITU, 2012). In 2011, there were 6 billion overall,

with most of the increase coming from the developing world (4.5 billion). The widespread availability of mobiles would appear to represent a solution to the problem of ICT access. This research devoted significant attention to the interplay between mobile phones and public access.

Third, existing research has not demonstrated clear evidence of public access impacts.

> "[T]here is limited conclusive evidence on downstream impacts of public access to ICTs. The evidence that does exist suggests that the public access ICT model is not living up to the expectations placed on it. This is not necessarily because public access has had no impacts, but because its impact is particularly difficult to identify and measure. 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 and Fellows, 2009).

This project therefore aims to generate empirical evidence about a global phenomenon that continues to be prominent in the landscape of information and communication technologies. Evidence-based research is essential to inform the future development and execution of public access policies and practices.

All data, data collection instruments, methodological notes, and other resources from this study have been made open to other researchers, offering nearly limitless opportunities for further analysis. This represents the project's commitment to open research. It is hoped that other researchers will take up the challenge and make further discoveries.

This report comes at an interesting time. While mobile phone applications may dominate headlines, there is also resurgent interest in the importance of *place*. This is demonstrated by the worldwide explosion of innovation centers, hackerspaces, and coworking facilities — physical spaces where people can access technology and interact with others. The international development community, after drifting away from public access, is now re-engaging, examining the value of place through this new lens. Is the community coming full circle? The project team hopes this report will provide a valuable contribution to ongoing discussions about the value of public access for international development.

Structure of report

This report is organized into ten main chapters.

> **Chapter 2** introduces the conceptual framework and research design of the study. It situates public access within a broader ecology of how people access and use ICTs, focusing on what makes public access potentially unique. The research design is multifaceted, including national inventories, three types of surveys, and a number of in-depth studies.

> **Chapter 3** presents the top-level findings from the inventories and the venue and user surveys, focusing on country differences and providing a backdrop for the detailed findings presented in subsequent chapters. It also documents impacts related to the magnitude of the public access phenomenon.

Chapter 4 discusses the first-order impacts of public access venues — technology access, information access, and ICT skills.

Chapter 5 discusses the second-order impacts in the six domains of interest: Communications & Leisure, Culture & Language, Education, Employment & Income, Governance, and Health. This report is especially interested in the impacts experienced by more marginal users — those of lower socioeconomic status, as well as females, youth, older users, and rural residents.

Chapter 6 examines non-users, an important population that is frequently overlooked in studies of public access to ICTs. This group includes ex-users who may have received benefits at earlier times in their lives, as well as people who indirectly benefit from public access through family or friends.

Chapter 7 explores five in-depth studies on prominent issues in the academic and general discourse on public access, relating to the usefulness and impact of public access to ICTs.

Chapter 8 examines the benefits and costs of public access. Using three methodologies, the report presents low and high estimations of how people value the types of impacts reported elsewhere in this study.

Chapter 9 offers conclusions and discussion, beginning with the study's three research questions and moving through other salient findings with implications for development.

Chapter 10 presents a number of recommendations for three audiences: governments and other investors in public access; practitioners; and researchers.

This is a comprehensive report, synthesizing the findings from all components of the research. Readers may also be interested in the project's other reports, which go into greater detail on specific topics (available at www.globalimpactstudy.org). These include the in-depth study reports (listed in Appendix 3), a literature review, a user profile paper, and others. Further research carried out by the Amy Mahan Fellowship program[5] illuminates a variety of other public access features, uses, and outcomes.

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[5] The Amy Mahan Fellowship Program aimed to strengthen the capacity of emerging developing country scholars and to increase the volume of quality research from developing countries in the area of public access to ICTs. The program was named in honor of Amy Mahan, a distinguished colleague and dear friend who was active in the field of ICT for development until her passing on 5 March 2009. For further information, visit http://www.upf.edu/amymahan/.

2. Conceptual Framework & Research Design

Conceptual framework

The research framework guiding this investigation starts from what is already known about the general impact of ICTs: in a wide range of social and economic domains, these technologies have transformed production and exchange processes, increasing their efficiency and reach. Public access venues, the focus of this study, are places where the public can use computers and the internet — either for free or for a fee — such as telecenters, connected libraries, and cybercafés. As they bring ICTs within the reach of a greater number of people, public access venues amplify these impacts and bring their benefits to larger populations. For people who do not have private access to personal computers and internet connections, public access venues provide a substitute for private access.

However, it would be misleading to simply extrapolate from known impacts of ICTs and assume that as they multiply access, public venues multiply impact accordingly. The populations using public access venues differ in many ways from those who have private access. They use ICTs under different conditions, may follow distinct practices, and their purposes may not necessarily be the same. The research framework therefore takes three important stances to account for who uses public venues, what for, and how (see Figure 2.1).

Definition of public access ICTs

In the context of the Global Impact Study, "public access" is defined as computer and internet services that are open to the general public. The term "public" here does not refer to the source of funding or the business model. Both privately and publicly owned ICT venues can be considered public access venues — as long as their services are open to the general public. A cybercafé is therefore a public access venue, while a school library that can only be used by students and staff is not.

Public versus private access

The study framework articulates the usage practices specific to public access venues and situates them in relation to private access practices. Again, public use cannot be properly understood as a simple extrapolation of private use, because many of the ways people use public venues are inherently different from private use practices. Accordingly, the mechanisms leading from use to impact may well be different.

While acknowledging that public access brings technology to people who otherwise would not have it, a pervasive view considers it inferior to private access. The assumption is that users would prefer private use of ICTs, but must rely on public facilities because they cannot afford their own computers and internet connections. Public access is considered an inferior substitute, due to factors such as the lack of privacy in public venues, distractions from other users, restrictions imposed on computer use, limited opening hours, and the need to travel to the venue. From this perspective, public use is seen as a transitory solution — a form of "substitution": when private access becomes more affordable, thanks to

price drops or income gains, it is assumed that users will purchase private access and stop using public venues. Alternatively, as more affordable connected devices (such as mobile phones) become available, people would be expected to prefer them to public venues.

The present research framework makes room for an alternative view of public access, as a "complement" to private access. In this view, public use can in fact be superior to private use: people may have reasons to prefer public venues even when they have private access to information technologies. The public venue may offer more powerful computers, faster connections, or complementary services such as printing, training, or assistance. Public venues may be preferable when users want to work together or learn from one another, or for applications (such as multiplayer games) that require the participation of other users. Or users may want access when they are away from their home or office. For these reasons, users may continue to use public access long after they have acquired private access. Public access venues can thus provide a long-term complement to private access, leading to different kinds of ICT uses and different impacts from those envisioned by the substitution view.

Figure 2.1: Global Impact Study conceptual framework
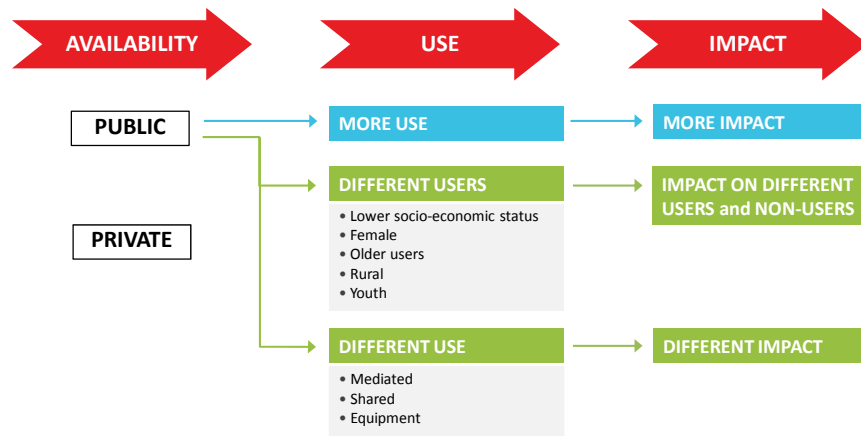
Figure 2.1 depicts the conceptual framework of this study. The blue arrows represent the direct "substitution" path. That is, the expanded availability of public access leads to increased ICT use and subsequently greater impact. The green arrows represent the alternative mechanisms by which public access can lead to impact, by reaching different users or by enabling different forms of use.

Who uses public venues?

An important characteristic of the framework is the particular emphasis it places on understanding the specific categories of users who gain access through public venues. Because the populations using public venues differ from those who enjoy private access, the link between access and impact is likely to be different. Public access venues typically aim to provide access for specific populations, including people of lower socioeconomic status, females, youth, older users, and rural residents — those too poor to afford private access, lacking technology literacy and skills, or excluded for some other reason.

There are strong reasons to believe that the mechanisms that lead from use to impact will be different for marginal users and for the general population. For example, internet access has positive educational impact for literate users by providing them access to a wealth of reading materials, but one cannot

assume that illiterate users will benefit in the same way. Likewise, it is known that better access to information yields more efficient markets and positive economic impact, but this does not apply to those excluded from market participation in the first place.

Moreover, public access may reach non-users through users, extending the benefits of ICTs into the community. Non-users also include ex-users, for whom public access may have served a transitory purpose at particular times in their lives. It is important to acknowledge and capture the role of public access in the lives of these non-users in order to fully understand and assess the impact of public access venues.

Therefore, an important research goal is to quantify and characterize the increased ICT reach brought about by public access venues. Increasing access, both direct and indirect, and providing first access has potential impact on disadvantaged populations. This research framework thus pays particular attention to these priority user and non-user populations and to the impact public access has on the various aspects of their lives.

What do people do in public access venues?

The study framework includes the broad range of activity domains represented in public access venue usage, incorporating specifically the domains that typically constitute important priorities for international development: Culture & Language, Education, Employment & Income, Governance, and Health. These domains correspond to the goals of many development programs: to preserve and promote local culture and languages, improve education outcomes, help people gain employment and secure income, promote civic participation, or improve health. In public access venues, these domains are typically served through using computers and internet connections as productive tools — for example, using a word processor to prepare a resume or to do school homework, accessing a government website to register for services, or searching the web for health information.

The framework accounts for a number of ways in which people's uses in public access venues may differ from those in private settings.

> **Better access:** Public venues can offer faster computers and broadband connections, or extra peripherals such as printers.

> **Assisted and mediated use:** Skilled assistance is critically important to many users. Infomediaries, who act as intermediaries between public venue users and information technology and services, offer a wide range of services and constitute an essential link to successful impact. Without them, some public venue users could not make effective use of information resources. Help comes in many forms, ranging from paid staff (such as librarians or cybercafé staff), to freelancers (such as the self-employed assistant found in some Bangladeshi cybercafés), to helpful strangers (whether directly helping or unintentionally modeling successful information use strategies), or helpful acquaintances, who may accompany a user to the public venue. These infomediaries provide a wide range of facilitation and intermediation services, usually for free.

> **Shared, co-present use:** Some information technology activities are inherently social. Working side-by-side can help with collaborative tasks or in teaching a new skill, and some computer games work best when players are in the same room. Users at public access venues often work together, play together, and learn from one another. Public venue rules, however, may discourage such shared practices because they can be disruptive for other users.

In addition, it is important to account for computer and internet uses which may not always be considered productive, such as computer games, social networking, computer chat, and email. The project team knows from prior research and observation that, in most parts of the world, users often go to public access venues to play computer games, chat with friends and family, or update their Facebook or Orkut. In a number of public access venues, such "non-serious" uses may be discouraged if not outright forbidden. But are non-serious uses of information technology merely a distraction? The study framework allows for testing two related hypotheses. First, users may be initially attracted to using computers in public access venues to play games or use Facebook, but may then go beyond that initial use to engage in other ICT activities. Second, and perhaps most importantly, what may seem like frivolous uses of ICTs may turn out to have important impacts. For example, gamers may acquire valuable generic computer skills, while social networking may help maintain social capital or provide direct sources to information and assistance that proves important to users when faced with life challenges. Thus, the study includes Communications & Leisure as a top-level domain of interest and studies the impact of related uses on the lives of public access venue users.

A careful examination of these practices (who uses, what do they use, and how) helps identify specific conditions that lead to greater use and impact. Analysis of the data can yield important insights to inform venue placement, design, services, rules, and other facets of public access operations. Furthermore, the analysis can be targeted to specific domains and populations.

Gauging impact

It would be extremely difficult to measure accurately the impact of public access venues and to reliably attribute these impacts to ICT use in public access venues (see OECD, 2007). Short of conducting a controlled experiment, it is impossible to determine whether any changes in the lives of public access venue users are the result of their technology use in public access venues.

This study uses a combination of approaches to gauge the impacts of public access venues. A first-level of analysis examines how public access venues affect digital inclusion, by changing access to and use of information and communication technologies. Within the conceptual framework described above, better access and increased use constitute by themselves important impacts, with significant consequences for people's lives. Beyond this first level, there is a second level of analysis that examines consequences in a range of domains: Communications & Leisure, Culture & Language, Education, Employment & Income, Governance, and Health.

A combination of several methodologies provided estimates of such second-order impacts. In most cases, the effective approach was to rely on self-reports by ICT users. The surveys asked respondents how 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, there are indications that self-reported data can provide valid approximations for objective data, despite the associated limitations of response bias. (For examples, see Crockett, Schulenberg, & Petersen, 1987; Junco, 2013.) To enhance the precision of data collected, in addition to asking respondents to report on the consequences (positive or negative) of public access use, survey questions also elicited more concrete perception information, asking for example about respondents' experience with specific tasks that lead to specific outcomes, such as applying for a job or better managing an illness. Finally, certain cases allowed direct measurements of changes in outcome variables. One example is a focused study in Brazil that 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 usage. A final approach was to use benefit

cost analysis to estimate impacts, employing two types of measures of impact, characterized broadly as stated preference and revealed preference measures. In stated preference measures individuals respond to questions on how they value public access venues, while in revealed preference measures researchers observe actions and deduce the benefits to users. The survey data collected indicate both how individuals self-report the importance of public access, and how their actions reveal the importance they place on public access. Together, this combination of approaches provides a gauge of the kind and magnitude of social and economic impacts deriving from technology use in public access venues, focusing in particular on the impacts of public access for vulnerable or disadvantaged groups and the main domains covered in this study: Communications & Leisure, Culture & Language, Education, Employment & Income, Governance, and Health.

An original intention of the study was to adopt a longitudinal approach, to measure impacts over time. Owing to the lack of reliable historical data, and the impracticality of collecting meaningful time series data within the project timeline, the research was ultimately designed as a cross-sectional study. Considering the constant flux in the ICT ecosystem, the data present a portrait of public access to ICTs at a particular time period, with no assumption that the current trends will continue into the future. The research design addresses this limitation by incorporating multiple lenses and by collecting data that attempt to elicit from research respondents historical information on public access uses and impacts, providing a yardstick against which future developments can be compared.

Research design

The research presented in this report was conducted in multiple national contexts, using various complementary methodologies to examine the public access phenomenon at various levels of analysis. The core focus was on five countries: Bangladesh, Brazil, Chile, Ghana, and the Philippines. These countries present a range of economic development levels and information technology penetration, a variety of public access histories and practices, and span three continents. That research is complemented by more limited studies in three other countries: Botswana, Lithuania, and South Africa. With the exception of Bangladesh, all the countries covered are officially classified as middle-income countries by the World Bank. However, this does not diminish their appropriateness as settings to investigate the impacts of ICTs on socioeconomic development. Recent global poverty data has shown that the majority of the world's poor now live in middle-income countries (70%–80% in 2008, according to Sumner, 2012). Research on poverty will continue to be relevant in these countries.

Although some of the results presented in this report analyze differences in the impacts of public access between countries, this research is structured to go beyond national comparisons to analyze variables across categories of user populations, domains of impact, and types of public access venues. This is a global study, and those who make use of this research need to be able to situate their own countries or interests within the range of contexts presented in this report.

The research approach rests on three main components.

1. In each of the five core countries, the project team conducted an *inventory* of public access venues to establish the contours of the public access phenomenon.[6]

2. Second, drawing a representative sample of venues from the inventory in each country, the research team conducted *three kinds of surveys*: a survey of venues operators; a survey of users in these venues; and a survey of non-users in the areas surrounding public access venues.

3. Third, *seven in-depth studies* were designed to examine in detail salient or contested aspects of public access venues.

Each of these in-depth studies focused on a specific question. Two relate to the public character of these venues, probing the impact of infomediation available through public access venue staff (in Bangladesh, Chile, and Lithuania) and the impact of shared use among public access venue users (in Ghana). The next two studies look at the impact of uses that are often prohibited in connected libraries and telecenters, though generally allowed in cybercafés: gaming and non-instrumental uses (in Brazil), and interpersonal communication such as chat, conferencing, and social networking (in the Philippines). The fifth study investigates the relationship between public use of computers and private use of mobile internet (in South Africa), examining the claim that mobiles make public access redundant. Finally, two in-depth studies were designed with alternative impact methodologies. The one conducted in Chile applies a cost-benefit methodology to estimate the value of public access (see Chapter 8). The other, conducted in Botswana, estimates impacts within the sustainable livelihood framework.

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[6] An inventory was also conducted in Lithuania.

Figure 2.2: Research design overview
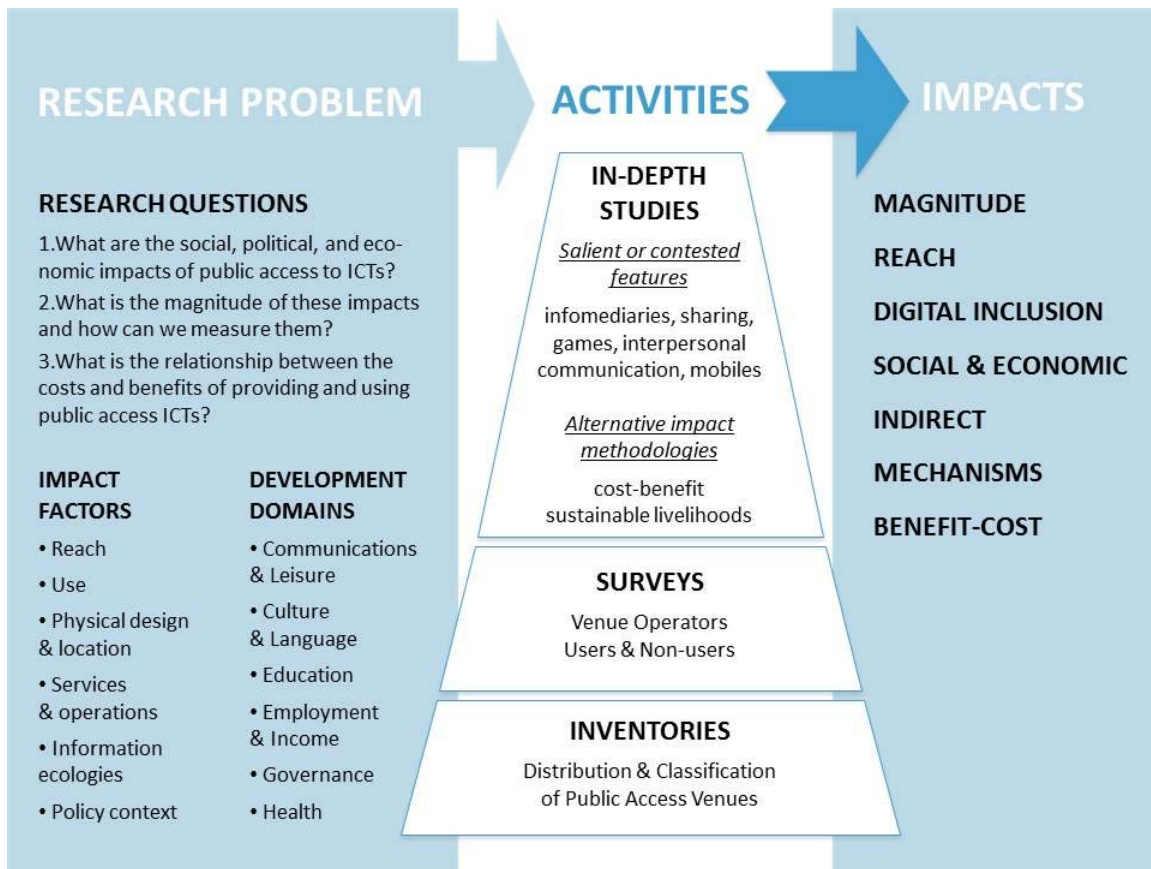
1) The *inventory* assesses the magnitude and contours of the public access phenomenon.

A first step in understanding the impact of public access to ICTs is to know how widespread public access provision actually is. As the project team began work on the Global Impact Study, it quickly became clear that there are no reliable estimates of the number of public access venues, or of their distribution among diverse categories — telecenters, connected libraries, and cybercafés. This is important not only to assess the extent and the various forms of public access, but also as basis for constructing a representative sample of venues for surveys. This information could also provide a reference point to estimate the significance of impacts observed in individual cases.

2) Three *surveys* provide a detailed analysis of uses and impacts within and around public access venues.

In each country, three extensive surveys were administered within a representative sample of public access venues, derived from the inventory. The first targeted public access venue operators, the second targeted venue users, and the third targeted non-users — people who do not use public access venues, but may be affected through their relationships with users or their membership in the communities surrounding public access venues. Data from these surveys provide a comprehensive picture of the nature, use, and impact of public access. Based on the research framework, the surveys explore four

complementary ways in which public access venues affect ICT usage: first, by providing improved access for existing ICT users; second, by providing access to new users and to non-users who benefit indirectly; third, by opening access to new applications and services; and fourth, by allowing different patterns of use than private access, including shared use or assisted use. The venue and user surveys probed the prevalence of these various mechanisms and asked respondents to report on their perceived impacts. While these measurements of self-reported impacts are obviously subjective, several questions were included that ask respondents to report objective benefits, such as a job application or participation in online courses. The surveys also asked for estimates of the costs of public access, from the perspective of both venue operators and users, including the costs users incur to avail themselves of the facilities.

Together, the inventory and surveys conducted in the five core countries provide answers to key questions about public access to ICTs: How much public access exists? What are the characteristics of different types of public access venues? Who are the users? What do they do? What impact do they report on their lives? What are some of the costs incurred in obtaining these benefits? These data are used to provide an estimation of the impact of public access provision on people's lives. The methodology for the inventory and surveys is described in more detail below.

3)   Seven *in-depth studies* explore impact mechanisms and contested issues.

Through exploratory work during the project's formative year, the project team identified a number of aspects of public access provision that attract particular attention, in part because they generate controversy, and that seemed to be related to significant impact mechanisms. In-depth studies were designed to address a selection of these issues, to complement and enrich the survey data.

The first two studies examine two attributes of public access that derive directly from the venues' public character: infomediation, as provided by public access venue staff; and the opportunities for shared use of information technology, derived from the presence of others in public access venues. The first study (*Infomediaries: Brokers of public access)* asks how the role of infomediaries affects the outcomes for public access venue users. Conducted in Bangladesh, Chile, and Lithuania, it draws on infomediary interviews, user focus groups, library manager interviews, field visits, and ethnographic studies. The second in-depth study (*Sharing: Understanding and Rethinking Shared Access)* seeks to better understand the forms of collaborative, co-present sharing in cybercafés, as well as the advantages and disadvantages associated with this sharing. It relies on a survey of users in two cybercafés in Accra, the capital of Ghana.

The next two studies examine gaming and interpersonal communication, as uses of information technology that are often discouraged in public access venues sponsored by public agencies or foundations. Such uses are often contrasted to "serious" applications, like word processing or creating spreadsheets, that enable public access venue users to perform such tasks as writing a report, producing a resume, or simulating financial outcomes for their small business. Yet a visit to any public access venue 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 Facebook page — what are called "non-instrumental" uses. The third study (*Non-Instrumental Use: Skills Acquisition, Self-Confidence, and Community-based Technology Teaching)* interviewed users of LAN-houses (a form of cybercafés) in Brazil to assess their usage profile, and then tested their skills to measure whether there are objective differences in the generic computer skills of gamers as opposed to "serious" users. The fourth study (*Interpersonal: The Impact of Cybercafés on the Connectedness of Children Left Behind by Overseas Filipino Workers)* used a combination of surveys and focus group discussions to understand how cybercafés function as a means for maintaining familial connectedness, focusing in particular on the extent to which children use cybercafé internet access to communicate with their migrant parents, and how they may be monitored by their parents via internet communication.

The fifth in-depth study (*Mobile: The Interplay of Shared Access and the Mobile internet for Teenagers in Cape Town*) explores whether, if everyone carries a private information device in their pocket, there is still a need to provide public access to information technology. Mobile phones are now broadly available throughout the developing world, prompting some to wonder whether they might obviate the need for public access venues. This study explores mobile internet use in South Africa, focusing on older teenage public access venue users in low-income neighborhoods of Cape Town, to identify the roles of public access and mobile internet use in their educational, cultural, and health-related web use and in civic involvement. It uses semi-structured interviews with public access venue operators, detailed interviews, activity/drawing probes, and task analyses with teenage public access venue users, as well as a closed-end questionnaire administered to 280 public access venue users.

The last two in-depth studies apply alternative methodologies to explore impact through different and complementary lenses. The first (*Perceptions of Value for Public Access to Information and Communication Technology in Five Countries: A Mixed Method Benefit-Cost Analysis Approach for Informing Policy*) assesses the costs and benefits of public access venues, using the contingent valuation method to assess individual willingness to pay for public access (by venue type and demographic characteristics). To test hypotheses about predictors of willingness to pay, the study asked respondents about their usage history and demographic characteristics.

The second alternative methodology study (*The Impact of Information and Communication Technologies at Libraries on Sustainable Livelihood Strategies and Outcomes in Botswana*) uses the sustainable livelihoods framework, which focuses on the factors that make people vulnerable to poverty and those that promote resilience, such as the individual's pool of assets (natural, physical, human, financial, and social) and the existence of an policy framework that enables the development of effective livelihood strategies. This study assesses the impact of ICT availability in public libraries on the livelihood strategies of public access users.[7]

These in-depth studies apply methodologies ranging from ethnographies and focus group discussions to interventions and experiments, in order to explore impact mechanisms in greater detail. Although these studies by necessity focus on a few specific sites, they derive greater value from an understanding gained through the inventory and the surveys about the prevalence of the particular observations. The combination of focused studies and broader findings provide the necessary background to make policy recommendations on important and controversial topics. Should gaming be banned or encouraged in public access venues? Are the benefits equal to the costs of providing staff assistance or infomediation? Are there possible arrangements of public access venues or configurations of ICT tools that foster productive sharing? While the inventory and surveys can assess existing arrangements, these in-depth studies provide a complementary avenue to determine whether changes to current arrangements might yield more significant impacts.

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[7] Data from this study was not available for this report and will be released separately.

Theoretical approach

There is a range of theoretical perspectives in the ICT for development (ICTD) arena with relevance to this project (see Heeks & Molla, 2009 for an overview of ICTD frameworks). While allowing room for some overarching theoretical perspective (such as theories of development or change), considering the wide variety of issues to be investigated the project needed to accommodate multiple theoretical frameworks. The project team took a grounded approach, starting from an examination of existing trends in the target countries and applying specific theoretical perspectives or concepts appropriate to the particular aspects of the research. The theoretical perspectives addressed in the project include: inputs to impacts theory of change; stages of access to ICTs; social life of information; identity and agency; and digital habitus.

Data analysis

The three research components — inventory, surveys and in-depth case studies — were designed to stand alone and to complement each other. The inventory provided a rudimentary basis for estimating the prevalence of public access in the research countries and for describing the range and features of existing venues. Data from each of the surveys were primarily categorical in nature and were analyzed to identify basic trends within countries, as well as similarities and differences between countries and venue types. Chi-square tests were used when applicable to evaluate contingency tables and determine which of the many observed differences between categories were statistically significant.

In addition to the in-depth case study reports, the findings of the in-depth studies were compared to data on related topics in the surveys to identify areas of consistency or difference.

Strengths and limitations of the research design

Strengths
- Achieves both breadth and depth of analysis through use of multiple methods: multi-country surveys and country-specific case studies
- Combines quantitative and qualitative methodologies, to complement detailed understanding of impact mechanisms with assessment of their prevalence
- Utilizes multiple complementary theoretical approaches
- Leverages local knowledge by involving local experts to adapt design to individual country context
- Targets the outcomes of public access use as opposed to ICT use in general
- Accounts for indirect uses and impacts, an often overlooked component of public access assessments

Limitations
- Complexity of design
- Methodology is not applied uniformly across all countries, presenting some analytical challenges

- Does not employ a common theoretical frame across the different methods
- Depends primarily on self-reported impacts

Inventory and survey methodology

A basic overview of the methodology for the inventory and survey activities is provided in this section. More detailed descriptions are available in the survey methodology report (Survey Working Group, 2012) and on the Global Impact Study website (www.globalimpactstudy.org).

Inventories of public access venues

The national inventories provide a measure of the extensiveness of the public access ICT phenomenon, as the essential backdrop for interpreting the detailed Global Impact Study findings. The inventories enable analysis of the size, composition, and geographic distribution — and possibly the evolution — of public access venues within each country. They can also support cross-country comparisons to shed light on the diversity of public access modalities. The inventories were conducted in the five core research countries, Bangladesh, Brazil, Chile, Ghana, and the Philippines, as well as Lithuania.

Research teams in each country compiled data on the number, types, and locations of public access venues, guided by a carefully designed taxonomy developed specifically to enable the categorization of public access venues in a consistent way across countries. Collection of this information was accomplished through an iterative process, designed to capture data for venues that were actually operating, not those planned for the future or those that had already closed. A general requirement was that data be collected from existing administrative data sources offering a high degree of confidence. The taxonomy accounted for all important modalities, such as distinguishing between private and public ownership, the availability of services for a fee or free, and type of venue.

For the venue type, the terms "telecenter" and "cybercafé" were deliberately omitted as sub-categories of venue type, due to the existence of varying definitions of these types of venue. Instead, a generic designation of "stand-alone facility" was used to classify such venues. The *ownership* and *business mode* taxonomy categories provide additional detail that distinguishes between the telecenter-type (public or NGO-owned, not-for-profit) and cybercafé-type (privately owned, for profit). Although this is not a perfect solution, it allows for greater control in data collection without assigning a rigorous definition that may be inappropriate or difficult to implement in some countries. For simplicity, however, this report refers to venues in the surveys using the standard labels of cybercafé, telecenter, or library.

Libraries in this study refer to *connected* public libraries, that is, those that offer public access to computers and the internet. The inventory and survey revealed that, despite the information in many administrative sources, the majority of public libraries in the core research countries did not in fact meet the Global Impact Study definition of public access: initial sources indicated a much larger number of connected libraries in the sample countries than found on the ground. (Telecenters and cybercafés are by definition equipped with public computers, and generally internet access as well.) Further details on the taxonomy are contained in Appendix 1.

For reference purposes, Table 2.1 shows the total number of public and community libraries in each country (including those that do not offer computer and internet access).

Table 2.1: Number of libraries, by country

Country	Number of libraries
Brazil	5,097
Lithuania	1,335
Philippines	1,124
Chile	526
Ghana	257
Bangladesh	68
Total	8,407

Source: 2010 and 2007 IFLA World Reports

LIMITATIONS

While they are deemed to be the best that exist in this area of research, the quality of the inventory data is limited by the following factors:

- Dependence on administrative data sources
- Limited data on cybercafés due to low official registration levels and high turnover

Based on their local knowledge, data collection teams provided estimations of their level of confidence in the data they submitted, as accurately representing the totality of public access ICT venues in their country. As explained in the methodology report (Survey Working Group, 2012), an average of 20% of cybercafés either did not exist or had closed at the time of the visit.

Similarly, since the definition of a rural or urban area varies in different countries and sources, the designation of a venue as rural or urban is based on the research teams' knowledge of local definitions. (See Appendix 2 for country definitions.)[8]

The surveys

Covering five countries (Bangladesh, Brazil, Chile, Ghana, and the Philippines), the surveys were designed to address 14 research questions:[9]

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[8] All venues in the inventory were geolocated, allowing for GIS and other analytical techniques. Raw data and maps can be accessed through the project's inventory database, http://database.globalimpactstudy.org.

[9] Lithuania was not included in the survey activity, as a similar survey occurring in libraries during the same time period raised concerns about survey fatigue at the venues.

1. What is the demographic profile of public access ICT users and non-users?

2. Apart from public access ICTs, what other information and communication resources do public access ICT users and non-users have?

3. What are the ICT skills and ICT use comfort levels of public access users?

4. Why do people go to public access ICT venues?

5. What are the reasons for non-use of public access ICT venues?

6. What do people do at public access venues?

7. How accessible are public access ICT venues and services to different types of populations?

8. How do the design, services, and operations of public access ICTs affect usage patterns?

9. What do public access users see as the impacts of using public access ICTs?

10. What outcomes can be associated with public access ICT use in different domains?

11. Are the outcomes non-users experience from use of non-public access information and communication resources similar to the outcomes experienced by users of public access ICTs?

12. Does public access ICT use have indirect impacts?

13. What is the value of public access ICTs to users?

14. What is the cost of providing public access ICTs?

These questions were explored through three distinct surveys: 1) public access ICT venue operators; 2) public access ICT venue users; and 3) public access ICT non-users. The venue operator survey gathered information on the operational characteristics, design, services, and costs of providing public access to ICTs. The user survey gathered information on users' characteristics, usage patterns, and perceived impacts of using public access ICTs. The non-user survey gathered information on the characteristics of non-users, 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. These teams also participated in the survey design and pilot testing of the questionnaires.

VENUE SURVEY METHODOLOGY

A total of approximately 250 venue operators were surveyed in approximately 250 randomly-selected public access locations throughout each country. Selection of the venues to include in each sample was determined using the inventory of public access venues in the country along with input from the country research teams. The target population included all venues in the country, both urban and rural. Given that the primary purpose of the operator survey was to investigate venue characteristics (though a secondary aim was to understand respondent demographics), multiple operators were allowed to provide information for a single interview. All surveys were face-to face and researcher-administered.

While cybercafés are prevalent in all countries of the Global Impact Study, libraries that offer public access to ICTs were few and hard to find in all the countries except Chile. As noted above, even though administrative sources indicated the presence of public access computing, on-site visits to the libraries revealed that a large proportion did not in fact offer computer and internet access to the general public. Further, while administering the surveys in Bangladesh, researchers found that although rural

community libraries often have computers, they are generally located in schools and are restricted to student use.

Chile, by contrast, has a well-known network of such libraries (Bibliordes) that offer public access to computers and the internet, and they represent almost 70% of the study's total library sample (71 of 103). Therefore, many of the findings referring to public access from libraries are applicable primarily to Chile and cannot be generalized to the other countries of the study. Statements relating to other countries must be interpreted with the knowledge that such findings pertain to a very small total number — a handful of libraries in each country. While not as acute as for libraries, a similar situation exists for telecenters: the results on telecenters must be interpreted as largely reflecting the situation in Bangladesh.

For more detailed information on the venue survey methodology, see the survey methodology report (Survey Working Group, 2012).The final venue sample is provided in Table 2.2.

Table 2.2: Final venue sample

Country	Libraries	Cybercafés	Telecenters	Other	Total
Bangladesh	4	99	148	0	251
Brazil	6	192	39	5	242
Chile	71	109	22	41	243
Ghana	4	220	14	12	250
Philippines	18	229	13	1	261
Total	103	849	236	59	1,247

USER SURVEY METHODOLOGY

A total of approximately 1,000 users, over the age of 12, were surveyed in approximately 250 randomly-selected public access locations throughout each country (the goal was to sample four users per venue). Users were selected in each venue attempting to capture an equal number of males and females. The sample was also dispersed both by day of the week and time of day (morning, afternoon, evening/night). Age was not a stratification variable. Each country research team worked with the Survey Working Group to develop a locally relevant strategy for selecting individual users. The typical approach was to select every n^{th} person observed using a computer in the venue. All surveys were face-to face and researcher-administered. For more detailed information on the user survey methodology, see the survey methodology report (Survey Working Group, 2012).

NON-USER SURVEY METHODOLOGY

The non-user sample reflects a snapshot of non-users who live in areas with public access. A total of approximately 400 non-users in each country were identified through *household surveys,* administered in communities surrounding selected venues from the user and operator survey samples. The goal was to provide an analytical counterweight to public access users and to allow comparisons between the two groups in terms of their demographic and socioeconomic profiles. This also allowed collection of information relating to the reasons for non-use, when distance is not a factor. Therefore, even though

the majority of individuals in the project countries are non-users, the sample of non-users does not necessarily reflect the national population, but rather the population in areas where public access venues are available. Communities for the household surveys were selected by the local research teams and stratified based on the relative density of venues in the area. The method for the actual selection of households and non-users varied on a country-by-country basis, to allow for variations in community features and customs.

The Survey Working Group assisted the country teams in developing their strategies, following a basic structure. In each household selected, interviewers asked the first available adult a series of questions, including: Which household members do *not* use public access ICT venues? The interviewer then selected one of the individuals identified to participate in the survey. This respondent selection was designed to maintain equal gender representation while allowing for age variation. A typical strategy employed was as follows:

- Household 1: oldest male
- Household 2: youngest male (over 12)
- Household 3: oldest female
- Household 4: youngest female (over 12)

The respondent was then asked a series of questions designed to 1) confirm that he/she was indeed a non-user and 2) determine the non-user type. (See Chapter 6 for more detail on non-user types.)

All surveys were face-to-face and researcher-administered. For more detailed information on the non-user survey methodology, see the survey methodology report (Survey Working Group, 2012). The final user and non-user sample is provided in Table 2.3.

Table 2.3: Final user and non-user samples

		Bangladesh	Brazil	Chile	Ghana	Philippines	Total
Users	**Male**	786	587	540	754	572	3,239
	Female	218	373	455	246	466	1,758
	Missing	0	5	2	0	6	13
	Total	1,004	965	997	1,000	1,044	5,010
Non-users	**Male**	200	202	154	172	200	928
	Female	200	197	245	223	200	1,065
	Missing	0	1	1	5	0	7
	Total	400	400	400	400	400	2,000

Summary of survey methodology

- *Venue operators*: 1,247 public access venue operators or owners, sampled on the premises of public access venues

- *Users*: 5,010 public access users, sampled on the premises of public access venues
- *Non-users*: 2,000 non-users, sampled at their homes, in communities surrounding public access venues

LIMITATIONS

Gender. It was not possible in all countries to get equal gender representation in the user survey. Chile and the Philippines came closest to the ideal distribution, but the overall pattern was that public access venues tend to be patronized a lot more by males than by females.

Results not truly national. In Chile and Bangladesh, the user surveys included every region of those countries and can thus be considered truly national. In the case of Brazil, Ghana, and the Philippines, the surveys were administered only in key regions, for a variety of reasons, and the results are applicable only to the regions covered by the survey. In addition, since the non-user survey was not implemented in areas without public access venues, it cannot be considered representative of all non-users nationally.

Inventory limitations. The inventories served as the starting point for generating the survey samples in each country. While the inventories are the most comprehensive available set of this type of data, they were nevertheless deemed incomplete to serve as exclusive survey frames, particularly in capturing cybercafés — for the reasons described above, in the inventory limitations section. Enumerators in the field quickly learned that many venues in the lists no longer existed, were temporarily closed, or were not truly public access venues as defined by the study (i.e., they had restrictions on who could use the venue, such as by gender). This was particularly true with public libraries in Brazil and Bangladesh. Because sampling regions were pre-determined, with resources allocated to those regions, expanding the survey coverage area to take into account lower-than-expected venue counts was not feasible.

Representation of different public access models. As already noted above, there is a disproportionate number of cybercafés in the sample, compared to libraries. This is not merely an artifact of the sampling method, however. In fact, except in Chile, **the phenomenon of public libraries offering public access was embryonic** at the time of the venue survey. This finding suggests that, although individual country findings stated in this report are reliably based on the data collected, these early observations cannot tell us how patterns of use may change, as public access in public libraries becomes more widespread.

Statistical testing. In relation to use of chi-square statistical tests, one caveat relates to the complex relationships that may exist between multiple variables: for example, in Bangladesh, users who are *less skilled* report lower perceived impacts, but they are also more likely to be *rural telecenter* users). Such relationships, while possibly influential, are not accounted for in the test. Another limitation of the test is that information beyond the basic P-value is not available (e.g., whether some categories have larger differences than others). The statistical significance of the observed differences is presented with these limitations in mind, and without attempting to address all the possible complexities.

Details of the survey methodology, including the survey design, sampling strategies, survey instruments, and challenges and limitations, are available in the survey methodology report (Survey Working Group, 2012).

ICT profile of project countries

The eight countries in the study represent diverse infrastructure and usage environments, with Lithuania being the best resourced and Bangladesh the least resourced in computer and internet access (Table 2.4).

Table 2.4: Computer and internet indicators (%)

Country	Internet users	Households w/ a computer	Households w/ internet access
Lithuania	65	62	62
Chile	60	51	39
Brazil	45	45	38
Philippines	29	15	15
South Africa	21	20	10
Ghana	14	10	4
Botswana	7	7	6
Bangladesh	5	4	3

Source: ITU ICT Eye, www.itu.int

Chapters 3 to 7 present a selection of the inventory and survey results to create profiles of the public access environment, user and non-user behaviors, and perceived impacts in the five core countries (and, to a limited extent, Lithuania). The data in Chapter 3 are analyzed primarily along country lines. Other chapters of this report focus rather on trends that cut across countries.

3. Public Access: Landscape & Realities

A central goal of this research is to identify trends that cut across different locations, but these trends are also unavoidably influenced by a range of conditions on the ground. This chapter draws on data from the project inventories and surveys, as well as national statistics, to provide profiles of the countries included in the study. This information provides an analytical lens to compare countries with different circumstances — types, levels, breadth, and depth of user (and non-user) behaviors — enabling us to understand patterns of use and the resulting outcomes. Public access impacts do not exist in isolation. They flow from usage patterns that in turn are linked not only to infrastructure and services but also to the goals, needs, and desires of the individuals engaged with the public access phenomenon, whether directly or indirectly. The Global Impact Study countries represent a range of such socioeconomic, political, and technological contexts.

This chapter describes the distribution of public access facilities (based on the Global Impact Study inventories) and provides for each country a profile of public access users, the range of public access venue services, and a brief overview of usage patterns (based on the Global Impact Study surveys). The most comprehensive coverage is available for five countries: Bangladesh, Brazil, Chile, Ghana, and the Philippines. These five countries carried out all three research components (inventory, surveys, and in-depth studies).

The data show a multifaceted landscape of public access venues with various business models (the mix varies by country) and a wide range of general and specialized services. The breakdown of public access users is equally diverse, with youth, adults, males, females, workers, and students represented in varying degrees, depending on the country and/or type of venue.

Findings from the inventories

The following analysis reflects the final inventories as of December 2011. It represents the counts in the inventories created, with all their strengths and limitations. (See Chapter 2 for the inventory methodology and limitations.) Countries covered here are Bangladesh, Brazil, Chile, Ghana, Lithuania, and the Philippines.

Types of public access venues: For ease of analysis, public access venues in this report are categorized as libraries, telecenters, or cybercafés. However, these distinctions are subject to large variations in different countries. The inventory was therefore structured to avoid these labels (except to identify libraries), in order to capture specific venue characteristics. Thus, Figure 3.1 and Table 3.1 include both telecenter and cybercafé-type venues under "stand-alone" facilities — venues that are primarily devoted to providing access to computers, the internet, and related peripherals (in contrast to others that may have a broader repertoire of services or different strategic foci).

Public access venue distribution

The distribution of public access venues varies widely across the project countries.
Using data from the Global Impact Study inventories, the figures below show the relative numbers of each venue type in the six countries.

Figure 3.1: Proportion of public access venues by country
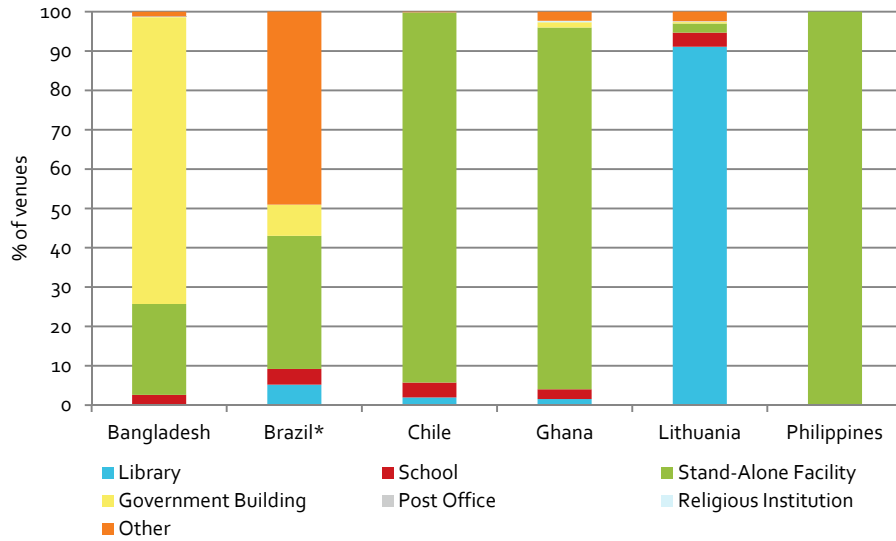
Table 3.1: Number of venue types by country

Country (total # of venues)	Library	School	Stand-Alone Facility	Government Building	Post Office	Religious Institution	Other
Bangladesh (5,656)	11	138	1,304	4,121	15	0	67
Brazil (13,762)*	722	549	4,676	1,093	0	5	6,781
Chile (21,147)	415	803	19,878	2	0	11	38
Ghana (511)	8	13	478	7	0	2	12
Lithuania (1,390)	1,266	50	32	5	0	3	34
Philippines (23,078)	67	0	23,011	0	0	0	0

Note for Figure and Table 3.1: Venues in Brazil categorized as "other" are primarily government-run initiatives (difficult to categorize due to the limited administrative data available)

1. The density of public access venues is country-specific.

Different countries will have different overall levels of connectivity at any given point in time, in addition to being at different stages of public access venue development. An issue of relevance is therefore the relationship between a country's level of connectivity and the extent of the public access phenomenon in that country. (This relationship will be reflected for example in the composition of their users).[10] The available inventory figures are shown in Table 3.2.

Table 3.2: Public access venues by country, 2011

Country	Population (millions)	Internet use[1] (%)	Venues (#)	Density[2] (per 100,000 individuals)	# of PCs[3] (estimated)	People per PC[4] (estimated)
Bangladesh	142.3	4	5,656	4	52,035	2,735
Brazil	192.4	41	13,762	7.2	225,697	85
Chile	17.4	45	21,147	121.5	249,535	7
Ghana	24.2	10	511	2.1	5,723	43
Lithuania	3.2	62	1,390	43.4	N/A	N/A
Philippines	97.6	25	23,078	23.6	426,943	23

Sources: Global Impact Study inventory, ITU 2012, Global Impact Study country research team reports.
1 – Internet use refers to percentage of individuals using the internet (ITU data).
2 – Density of public access venues (estimate based on inventory and population data)
3 – Number of PCs in public access venues (estimate based on survey and inventory data)
4 – Ratio in public access venues (estimate based on survey and inventory data)

2. No linear relationship is seen between public access to ICTs and overall connectivity.

As Table 3.2 shows, no linear relationship exists between a country's overall connectivity and the extent of public access. To some extent, this may be due to the dynamism of the public access phenomenon. A detailed analysis would require a time-series to reveal the (non-linear) evolution of overall access to ICT and the trajectory of the public access phenomenon.

Countries with higher (private) connectivity (e.g., Chile and Lithuania) have a higher density of venues compared to countries with lower connectivity (e.g., Bangladesh and Ghana). In addition, they have a lower people-to-PC ratio in public access venues. In other words, they have higher private as well as public access. Within the lower connectivity group, however, Bangladesh has more public access but lower connectivity than Ghana. (Connectivity is measured by the overall percentage of internet users,

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[10] See: Sciadas, G., with Lyons, H., Rothschild, C., & Sey, A. (2012). *Public access to ICTs: Sculpting the profile of users.* Seattle: Technology & Social Change Group, University of Washington Information School.

shown in column two of Table 3.2.)[11] Similarly, in the high-connectivity group, Lithuania leads Chile in internet use but lags in density of public access. Each country has a unique configuration, the combined effect of the parallel evolution of its overall connectivity and public access systems.

The dynamic that emerges from this analysis is that some initial internet connectivity is necessary to kick-start the development of public access, and as that development gains strength it in turn promotes an increase in private access. This cyclic expansion of private and public access happens at different speeds in different countries. It also complements the observed trends of expanding connectivity — with initial penetration among high-income, high-education segments of the population followed by progressive extension to other population segments (also at different speeds in different countries). Societal and cultural norms also play a role, especially when public access offers advantages beyond those of private facilities. For instance, cybercafés are reported to have largely disappeared in Lithuania as connectivity increased, leaving only connected libraries for public access. This did not happen in Chile, perhaps for cultural reasons. Similarly, compared to Bangladesh, Chile has a longer history of public access and continues to have higher density, in spite of the increase in private access.

3.   Public access venues are prevalent in urban areas.

While the inventories show that venues are spread throughout each country, their distribution is decidedly skewed in favor of big urban centers (Figure 3.2). This is particularly true for private venues of the cybercafé type. Considering the significant rural populations in the countries concerned, density by population is much higher in urban centers. This does not necessarily indicate a shortage of venues in rural areas: the surveys show that the busiest public access venues were found in urban centers. However, this does not mean that rural locations are adequately served either. Further investigation would be necessary to determine why rural venues tended to be less busy — venues could, for example, be located in sparsely populated areas.

As shown by other studies (e.g., Proenza, 2012), the problem of public access sustainability is generally much more acute in rural settings. This also relates to the type of venues as, generally speaking, the rural market cannot sustain cybercafés. The Global Impact Study surveys of public access venues across the five countries found that cybercafés were located mainly in areas of high economic activity (49%) and average economic activity (43%). Only 8% were located in isolated areas.

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[11] The density of connected PCs is lower than the density of public access, as some PCs in public access venues are not connected to the internet.

Figure 3.2: Proportion of urban public access venues
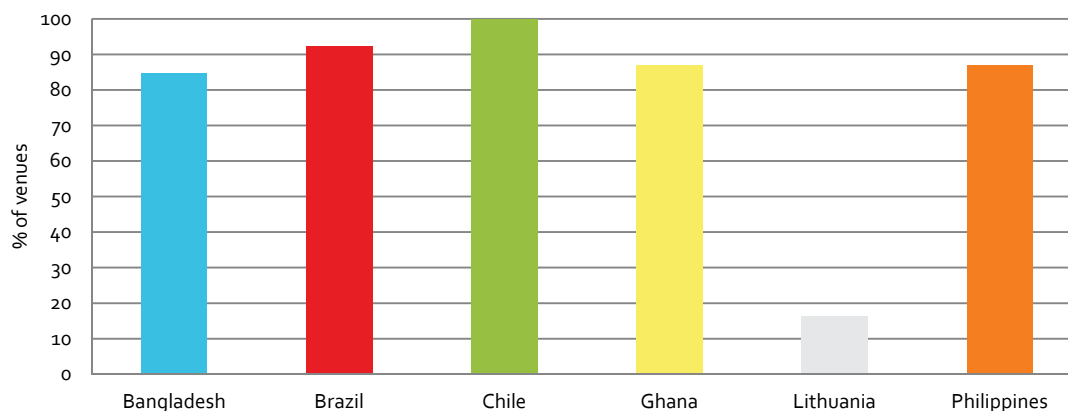
Note: Based on data from the inventories constructed for the Global Impact Study in 2011.Some of the peculiarities of these distributions (e.g., no rural venues in Chile) are attributable to the way urban and rural communities are defined in each country. (See Appendix 2 for country definitions.)

4. Cybercafés dominate public access landscape…but not everywhere.

The patterns of ownership that emerge from the inventories are diverse and interesting. Table 3.3 shows the prevalence in each country of venues by type of ownership. The "private" venues are typically cybercafés. The types of venues and their characteristics tend to be influenced by national idiosyncrasies, such as the gaming culture in Brazil, and by the stage of evolution of the public access phenomenon in each country.

Table 3.3: Ownership of public access venues, by country (%)

	Privately owned	Publicly funded	NGO	Other	Total
Bangladesh*	18	1	5	76	100
Brazil	34	22	32	12	100
Chile	94	6	0	0	100
Ghana	83	16	1	0	100
Lithuania	2	95	2	1	100
Philippines	95	5	0	0	100

* Note: Venues in Bangladesh categorized as "other" are primarily quasi-public entities with mixed ownership

In Chile, a country with both high relative connectivity and high public access density, a key trend is the general predominance of private cybercafés — even though it is also the best known example of connected libraries (Biblioredes). The same pattern also holds for the Philippines, a country with low connectivity, and for Ghana, a country with relatively lower connectivity as well as lower density of public access venues.

In contrast, the public access landscape in Bangladesh is dominated by quasi-public entities, and the share of cybercafés is much smaller (under 20%). Public access venues have a shorter history in Bangladesh, and there are efforts underway to increase publicly-funded venues. The case of Brazil is different from all others, with more equal shares of privately and publicly owned venues. In the more developed countries, private (household or personal) access has matured to the point that many privately owned public access venues have closed down. However, this pattern may not prove true elsewhere. Moreover, the trajectory to high connectivity rates may take decades, in most low-income and middle-income countries. Finally, the study data indicate that public access is not a mere substitute for private (household or personal) access, and that there are functional reasons for long-term co-existence of public and private access (discussed in Chapters 7 and 9).

5. The profit motive is alive in public access.

Cybercafés are by definition private businesses, and since they represent the majority of public access venues in most countries, the presence of profit incentives in the provision of ICT services can be easily established (see Figure 3.3). Beyond that, however, the data show that even not-for-profit venues (telecenters and libraries) are affected by the need to realize financial returns, in that they often explicitly focus on recovering their costs and supporting new programs through user fees. Interestingly, in the case of Bangladesh, many non-private venues also operate as commercial enterprises (Figure 3.3).

Figure 3.3: Business mode of public access venues
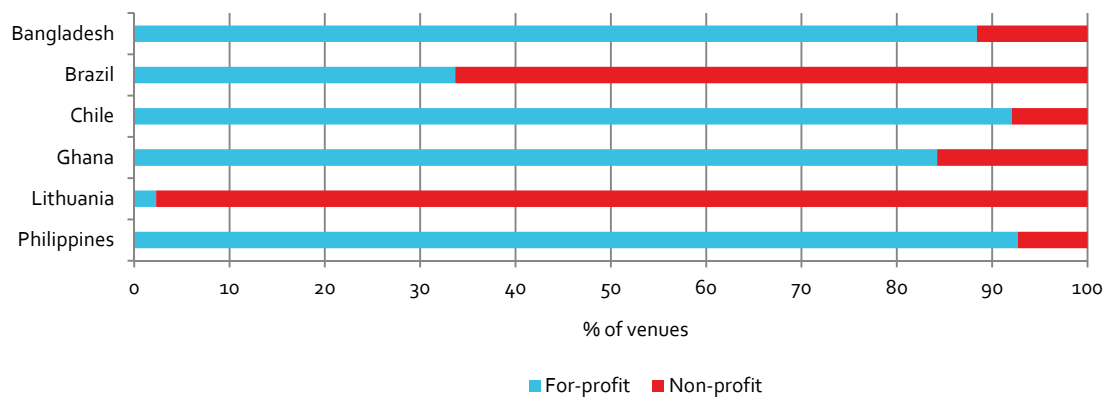
Findings from the surveys

Venues

The survey of public access venues describes their characteristics and operations, including physical access and configuration, financing, staffing, and traffic. This section discusses some of these findings for Bangladesh, Brazil, Chile, Ghana, and the Philippines.

INDEPENDENT CYBERCAFÉS, AFFILIATED TELECENTERS

Public access venues, as independent organizational entities, can also be linked, either horizontally, through networks, or vertically, through ownership. These modes of organization correlate with the particular financing model.

Cybercafés are not often affiliated with a broader organization. Only 11% reported such affiliations, without much variation across countries. By and large, they operate as private businesses, without public funding. When asked about financial health, the vast majority of responding cybercafés reported that they were either making money (69%) or breaking even (23%), with only modest variations between countries. This reflects the reality that money-losing cybercafés generally do not survive. In contrast, a majority of telecenters (72%) reported having an affiliation with a larger organization. There was modest variance between countries, with the Philippines having by far the fewest affiliated telecenters (46%), while Chile had the most (96%).

SOURCES OF FUNDING

The implications for financial support were not always clear. Support for telecenters tended to come from a few key sources (Table 3.4). For three of the five surveyed countries, one of the main sources was government support: in the Philippines, almost all (92%) of the telecenters depended on government funds, as did the majority of telecenters in Chile and Brazil (86% and 76%, respectively). Conversely, most of Bangladesh's telecenters did *not* depend on government support (84%), nor did a majority of Ghanaian telecenters (63%). NGO and grant support played a smaller role: on average, only 29% of telecenters credited NGOs and 15% credited grants as significant resources, although in Bangladesh 36% of responding telecenters said they depended on NGO support. Similarly, grants were an important source for about a third (34%) of Brazilian telecenters.

User/service fees were another important source for a majority of telecenters (56%). Telecenters in Bangladesh and Ghana, in particular, relied on this type of support (75% and 71%, respectively). For telecenters in Brazil and Chile, such fees were insignificant for a strong majority of venues (90% and 96%, respectively). Less important sources of support came from local communities and from other, unspecified sources. (See Table 3.4.)

Table 3.4: Top funding sources for telecenters, by country (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
User/service fees	56	75	11	5	71	46
Government support	38	16	76	86	36	92
NGO support	29	36	26	0	21	8
Grants	15	14	34	0	0	8
Community contributions	5	.7	13	23	0	0
Other	12	18	0	9	7	0

Note: n=236

For libraries, government support was by and large the most dominant form of support, with an average of 90% of responding libraries naming it as one of their top two sources. Other sources of support were far less common: 15% reported NGOs in the top two sources of funding, and 7% reported "other sources." Community support was cited as an important funding source for only a negligible number of responding libraries. For libraries, unlike telecenters, usage fees were not a usual source of funding: 89% said that such fees were not important.

For cybercafés, user/service fees were critically important (96%). Minimal operational support was received from other sources, such as governments, NGOs, grants, or community contributions. Chile was an exception, with 18% of responding cybercafés indicating that community support played an important role.

CYBERCAFÉS HAVE MORE COMPUTERS THAN OTHER VENUES, ON AVERAGE

Public access venues vary in size from very small shops, with a couple of computers, to very large establishments, able to accommodate tens of people at the same time, often bustling with activity. On average, cybercafés had the greatest number of computers for public use (14), followed by libraries (9) and then telecenters (7). The great majority of computers in each venue category was connected to the internet (Table 3.5). The lowest level of connectivity was in telecenters, with an average of 5 of 7 computers connected, reflecting the fact that in Bangladesh (where telecenters are predominant), less than half the computers had internet connections. In the other four countries, around 90% of computers were connected.

Table 3.5: Average number of computers in venues, all countries

	All	Libraries	Cybercafés	Telecenters	Other
Computers for public use	12	9	14	7	8
Computers connected to the internet	11	8	14	5	7

Note: n=1,247

LIBRARIES HAVE NEWER COMPUTERS

Libraries had proportionally more new computers than average, while cybercafés had fewer. More than half of telecenters in the venue survey did not answer the questions about the age of their computers, but those that responded indicated that their computers were a little more than two years old.

POWER OUTAGES AND OTHER PROBLEMS

Reliability of service is a well-known issue in public access venues. Thus, venues surveyed were asked to report on the frequency of having at least one-quarter of computers unusable, and the reasons for it. Power outages were the top problem, reported by 81% of cybercafés, 73% of libraries, and 48% of telecenters. Other common problems related to internet connection problems, viruses, and computer hardware problems.

CYBERCAFÉS OFFER MORE OPTIONS IN VENUE CONFIGURATION

Venue configuration showed a variety of models. Of the cybercafés, 41% were structured as private booths; 47% were open computing; and the remaining 12% were mixed, with both private booths and open computing. Among the libraries and telecenters, the vast majority of venues provided only open

computing (96% and 88%, respectively). For telecenters, the variation between countries was substantial: the prevalence of open computing ranged from 57% in Ghana to 100% in Chile.

CYBERCAFÉS ARE LESS ACCESSIBLE THAN TELECENTERS AND LIBRARIES

Wheelchair access was reported to be good among 44% of telecenters, 47% of libraries, and 32% of cybercafés. Brazil had the greatest percentage of cybercafés reporting good wheelchair access (42%), followed by the Philippines (37%), Bangladesh (34%), Chile (24%), and Ghana (21%).

INFOMEDIATION IS AVAILABLE IN CYBERCAFÉS

Public access to ICTs has an advantage over personal or home access in the area of infomediation and technical assistance — that is, the availability of knowledgeable people who can assist users with their ICT experiences. Conventionally, it is thought that cybercafé-type venues lack such resources, as compared to libraries and telecenters. However, the Global Impact Study found that cybercafés were on par with other venues regarding the average number of paid staff having skills to assist computer users with technical problems (averaging two for cybercafés, libraries, and telecenters).

Cybercafés were the least likely to have only paid staff: 71%, compared to 75% for telecenters and 89% for libraries. This may reflect the presence of entrepreneurs and their family members, who are technically not "paid" for their service. The higher tendency for libraries to have only paid staff may be explained by sustained government funding. Cybercafés and telecenters were similar in the percentage of only unpaid staff (16% of cybercafés and 18% of telecenters); just 3% of libraries had only unpaid staff.

The libraries surveyed averaged a similar number of paid male staff as other venues (around two), but more paid female staff members (three rather than just one).

TRAFFIC AND USAGE DIFFER BY COUNTRY

The landscape of public access venues is diverse, with a variety of types, sizes, and locations. Public access venues have generally become integral parts of their communities and figure prominently in the lifestyle of many users. In a typical day, 62 users visited each venue on average, for all five countries of the surveys and across all venue types. Daily visits ranged from a high of 75 users in Brazil to a low of 53 in Ghana. Cybercafés tended to be busier than libraries, with an average of 66 users a day as compared to 44 for libraries (Table 3.6).

Table 3.6: Average number of daily visitors, in a typical week, by venue type and country

	All	Libraries	Cybercafés	Telecenters
All	62	44	66	60
Bangladesh	60	16	55	65
Brazil	75	45	79	66
Chile	55	63	66	30
Ghana	53	22	56	25
Philippines	68	48	71	12

Note: n=1,247

Most users visit public access venues several times a week. In general, the number of unique visitors per week is more than twice the number of daily visitors (Table 3.7). For example, the estimated number of unique visitors per week was 135 in Bangladesh (compared with 60 daily visitors), 179 in Brazil (compared to 75), and 127 in Chile (compared to 55).

Table 3.7: Average number of unique weekly visitors, by venue type and country

	All	Libraries	Cybercafés	Telecenters
All	91	88	78	135
Bangladesh	135	4	143	132
Brazil	177	218	168	215
Chile	127	101	158	118
Ghana	5	10	5	8
Philippines	9	7	9	4

FEMALE USERS ARE A MINORITY, BUT...

According to the survey of venue operators, women accounted for 29% of unique visitors per week, averaging across the countries and venue types of the survey (Table 3.8). Libraries had the highest proportion of female visitors at 47% of users, compared to 28% for cybercafés and 23% for telecenters. In

Chile and Brazil, unique weekly female users were almost at par with males (48% across all venues). Female users were a minority of users in Bangladesh (10%) and Ghana (14%).[12]

In Chile, women represented a majority of library users (54%) and telecenter users (53%). In telecenters in both Brazil and the Philippines, women users exceeded men, at 55%. Women users were less prevalent in cybercafés, ranging from a high of 46% (Brazil) to a low of 9% (Bangladesh).

Table 3.8: Average proportion of females among unique visitors per week (%)

	All	Libraries	Cybercafés	Telecenters
All	29	47	28	23
Bangladesh	10	11	9	10
Brazil	48	39	46	55
Chile	48	54	41	53
Ghana	14	15	14	13
Philippines	34	39	32	55

Note: n=1,247

User profiles

This section is based on the User Profile paper (2012), which captures the results of the user survey. The following analysis is based on the distribution of the surveyed users and does not refer to the (unknown) true distribution of public access users in the countries of the study.

PUBLIC ACCESS USERS ARE YOUNG

Overwhelmingly, the public access users surveyed in all five countries were young, corroborating previous research. A large proportion of users were under the age of 25 (Figure 3.4). In the Philippines, in particular, these young users accounted for as much as 85% of the total. The lowest proportion was in Chile, though still a majority, at 56% of surveyed users.

While the age distribution of users differed by country, the highest percentages overall were the 16–19 and the 20–25 age groups (Table 3.9).[13] However, there was also a sizeable presence of young people in the 12–15 age range. This was particularly prominent in the Philippines (23%) and Brazil (21%) and much

[12] This situation is more pronounced in rural areas due to cultural norms, as discussed in the User Profile paper (2012). But note that, in Bangladesh, "infoladies" make house visits, so females are not necessarily deprived of access to public access venue services. This variation should be accounted for in future research.

[13] The age distribution of users as reported by venue owners/operators is roughly similar to that shown in Table 3.9.

lower in Bangladesh and Chile. This is indicative of a large number of young children whose upbringing includes public access venues.

Figure 3.4: Public access venue users under the age of 25
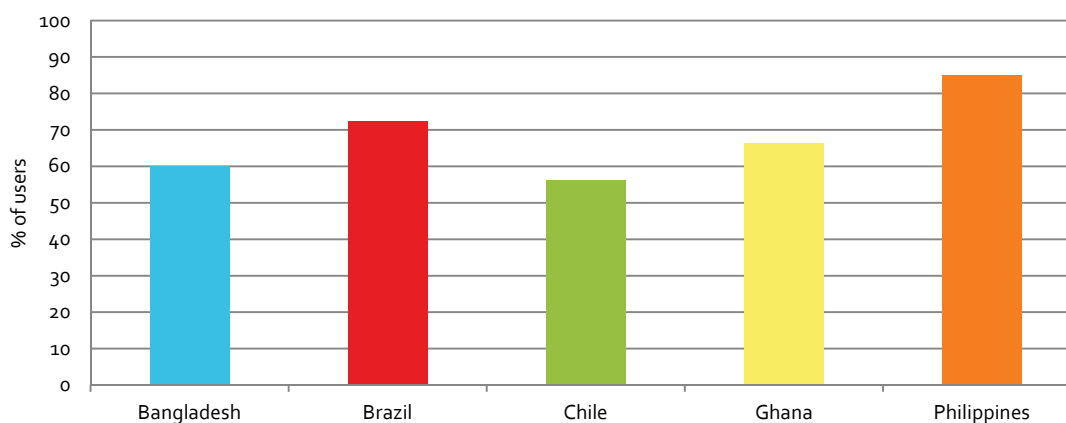
...BUT OLDER USERS ARE PRESENT TOO

In Bangladesh, the distribution of users is generally tilted more towards older ages, and a substantial proportion of users (28%) are in the 25–34 age bracket. Somewhat lower percentages were seen in Brazil and Chile, at about one-fifth. There is also a sizeable group of users in the 35–49 age group, particularly in Chile (16%) and Bangladesh (10%). Users over the age of 50 were few, with the exception of Chile, where they accounted for approximately 7%. (See Table 3.9.)

Table 3.9: Users of public access venues, by age (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
12–15	13	5	21	8	8	23
16–19	27	23	28	26	23	37
20–24	28	32	23	22	35	25
25–34	21	28	19	21	27	10
35–49	9	10	7	16	6	5
>50	2	2	2	7	1	.4
Total	100	100	100	100	100	100

Note: n=4,997

PUBLIC ACCESS USERS ARE EDUCATED

Across all countries, there were very few individuals with no formal schooling, and a very high percentage have college or university degrees (Table 3.10). The percentage of users with post-secondary or tertiary education was 22% in Brazil, 35% in Chile, 40% in Ghana, 56% in the Philippines, and more than 70% in

Bangladesh (partially explained by the higher proportion of older individual venue users in Bangladesh). These statistics show that the education level of public access venue users is much higher than the overall distribution in each country.

Table 3.10: Users of public access venues, by education (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
No schooling	2	3	6	1	.4	.4
Primary	16	7	34	18	18	5
Secondary	37	19	38	47	42	39
Post-secondary	14	31	8	18	7	7
Tertiary	31	40	14	16	33	49
Total	100	100	100	100	100	100

Note: n=4,973

MANY USERS ARE STILL STUDENTS

The education level of users is related to age. Many venue users are still students — more than 50% in Bangladesh and Ghana, around 40% in Chile and Brazil, and 35% in the Philippines (Table 3.11). The percentages are much higher at younger ages. These young users, already better educated, may go on to the next level of higher education, widening their difference as a group from non-users.

Table 3.11: Proportion of students in each user age group (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
12-15	77	98	86	100	91	53
16-19	68	93	54	81	86	44
20-24	42	65	17	46	49	22
25-34	15	14	9	15	23	8
35-49	2	1	1	.6	5	2
>50	1	0	0	0	11	0
Total proportion of student users	44	51	37	42	51	35

Note: n=4,950

… THE REST ARE WORKING

Public access users are economically and socially engaged. An overwhelming majority of all users are either employed (full-time or part-time) or full-time students (Figure 3.5).

Figure 3.5: Proportion of students and employed users
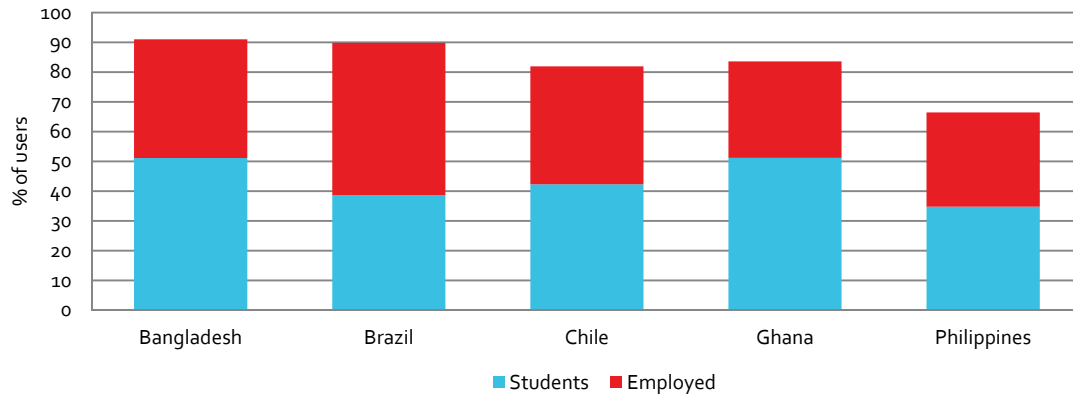
Among the employed, most are full-time, accounting for more than one-quarter of all public access venue users in Brazil, almost 20% in Bangladesh and Chile, and 15% in the Philippines. Self-employed users represented about 16% in Bangladesh, 12% in Chile, 11% in Brazil, and 6% in the Philippines.

PUBLIC ACCESS USERS COME FROM FAMILIES WITH LOWER TO MIDDLE INCOMES

Public access venues were initially regarded as a way to reduce digital exclusion: people without digital access could use computers and the internet at public access venues, either free of charge or at an affordable price. More recent research suggests that it is in fact the relatively well-to-do who frequent public access venues, and that these venues do not serve the very poor (Cecchini & Raina, 2004; Haseloff, 2005; Amariles, Paz, Russell, & Johnson, 2006; Mercer, 2006; Kuriyan & Toyama, 2007; Parkinson & Lauzon, 2008).

The data from the surveys show that generally users are of middle-income backgrounds. Brazil illustrates this pattern. For the very poorest income group — families with no income or with one minimal salary — the proportion of venue users (5%) is much lower than their overall percentage in the population (14%) (CGI, 2009). Similarly, at the top end of the income ladder, households with incomes more than ten times the minimum salary represent 7% of public access users, as compared to 10% of the total population. Most other groups show a similar pattern (CGI, 2009). However, families with two to three times the minimum salary — the lower middle-income group — are much more widely represented in public access venues (31%) than their percentage in the Brazilian population (17%) (CGI, 2009).

For analytic purposes, a "middle-income" metric was established, set at five times the poverty line for Bangladesh, Brazil, and the Philippines, and at the average household income level (2009) for Chile. There are very high concentrations of venue users *below* the metric (Figure 3.6). Ghana is an exception, with a majority of users reporting household incomes below the poverty line, though this may not be a reliable reflection of household income.

Figure 3.6: Proportion of users from low- and middle-income families
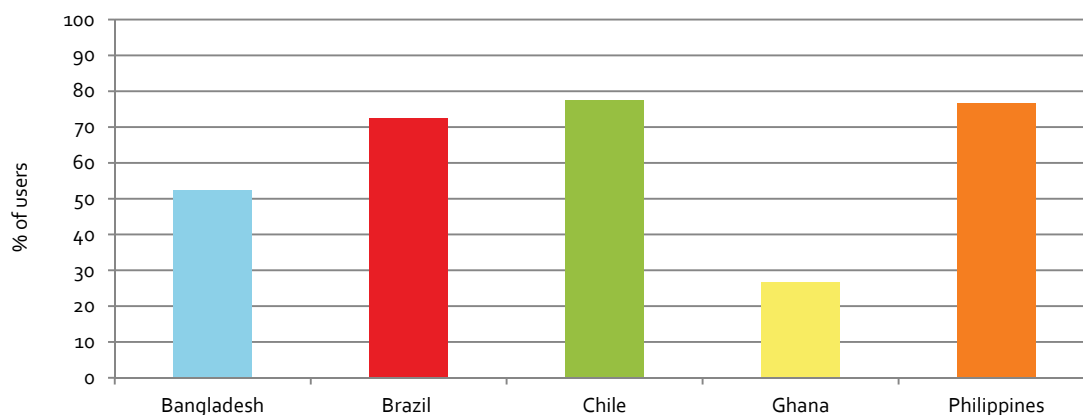
Note: Households with incomes between one and five times the poverty line in Bangladesh and the Philippines (excluding those below the poverty line); similarly for Brazil, but from 510 real (double the official poverty line); in Chile, from 179,000 pesos (average of bottom decile) to 610,000 (average income); in Ghana, households with more than 300 cedis.

In addition to income level, the survey captured complementary socioeconomic information. The majority of public access users live in families that own their home: nearly three-quarters in Bangladesh, more than 70% in Chile and the Philippines, 60% in Brazil, and just over 50% in Ghana. Most of the other users rent homes, although Brazil, Ghana, and the Philippines show sizeable proportions who occupy dwellings without payment (14%, 11%, and 10%, respectively). In general, public access users' homes have basic amenities such as electricity, as well as possessions such as TVs, satellites, and cars.

A substantial number have computers at home, often with internet connections — well in excess of their country's average in many cases. (See Table 3.12.) In Brazil, for example, home internet access among venue users was an impressive 41%, compared with the 24% national average (2009). Even in the Philippines, Ghana, and Bangladesh, venue users' connectivity levels were well above the average for these countries.

Table 3.12: Household ownership of computer and internet connection (%)

	Computer	Internet connection
All	56	28
Bangladesh	36	14
Brazil	62	41
Chile	76	34
Ghana	66	27
Philippines	42	25

Note: n=4,979

MOST PUBLIC ACCESS USERS OWN A MOBILE PHONE

Mobile phones are now broadly available throughout the developing world, prompting some to wonder whether they might obviate the need for public access venues. The user surveys confirmed that almost all public access venue users (96%) have access to a mobile phone within their household (Table 3.13). For most of them, using a mobile phone is not a novelty: 60% of public access venue users first used a mobile phone over five years ago, and the vast majority (88%) reported using a mobile phone daily or almost daily (Table 3.14). While there were minor variations between countries, the universal availability and use of mobile phones by public access venue users is remarkably consistent across the countries in this study.

Table 3.13: Household ownership of a mobile phone (%)

All	Bangladesh	Brazil	Chile	Ghana	Philippines
96	96	95	95	98	96

Note: n=4,977

Table 3.14: Frequency of mobile phone use (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Daily or Almost Daily	88	91	83	88	91	87
At Least Once a Week	7	5	13	8	3	7
At Least Once a Month	2	2	2	2	2	2
A Few Times a Year	.5	.3	.5	.5	.4	.8
Never	3	2	2	2	4	4
Total	100	100	100	100	100	100

Note: n=4,955

MOST PUBLIC ACCESS VENUE USERS DO NOT ACCESS INTERNET ON A MOBILE PHONE

Fifty-eight percent of public access venue users reported they had never used the internet on a mobile phone (Table 3.15). Overall, only 16% use the mobile internet more or less daily. There is substantial country variation: in Chile, 71% reported never having used the internet on a mobile phone, while in Ghana, almost the same proportion (73%) said they have used the mobile internet, including 56% who use it daily or weekly.

Table 3.15: Frequency of internet use on a mobile phone (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Daily or Almost Daily	16	15	11	5	36	13
At Least Once a Week	13	10	10	6	20	15
At Least Once a Month	6	5	3	7	8	6
A Few Times a Year	7	3	10	11	9	6
Never	58	67	66	71	27	60
Total	100	100	100	100	100	100

Note: n=4,778

These data suggest that ***mobile phones are not a substitute for public access***. An in-depth study examines in more detail the question of whether mobile internet should be seen as a complement or a substitute for other forms of access (Walton & Donner, 2012).

OPTIONS ARE NOT PLENTIFUL

For many users, public access venues are the only option they have to access ICTs, and particularly the internet. In most countries, this is true of a high percentage of users, especially in Chile, despite its overall high connectivity. Despite the stereotype of well-to-do users, the reality is that ***public access venues constitute the only option for many***.

However, the data also document other reasons for the use of public access venues, beyond basic access to ICTs. Many users go to the venues to use better equipment, to get help from venue staff or others, and, to a large extent, to work with or be with friends or other people (Table 3.16). There may also be other reasons not captured here, such as competition with family members and limited freedom at home. The digital divide does not by itself explain the use of public access venues.

Table 3.16: Main reason for using public access venues (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
No other option for computer access	15	16	8	9	11	15
No other option for internet access	33	35	15	44	47	33
To work or be with friends or other people	18	17	29	8	14	24
To get help from other users	2	1	4	2	3	2
To get help from venue staff	7	9	4	2	4	2
Better equipment than home or work	15	17	29	16	15	15
Other	10	5	11	19	6	9
Total	100	100	100	100	100	100

Note: n=4,790

LOCATION MATTERS

The vast majority of users live close to the public access venues they visit. Table 3.17 shows their distribution by country and by distance from the venue they usually visit. (The results were similar when users were asked how far they lived from the venue where they were interviewed.) In each country, a plurality live within one kilometer of the venue. In Chile and Ghana, over 80% live within two kilometers, as do more than 85% in Bangladesh and the Philippines. Only in Brazil do a substantial number of users venture more than five kilometers from home.

Table 3.17: Distance from residence to usual public access venue (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
< 1 km	58	58	46	60	62	66
1–2 km	22	27	16	21	22	19
3–5 km	10	8	15	8	10	8
> 5 km	10	7	23	11	6	7
Total	100	100	100	100	100	100

Note: n=4,204

MOST ARE FREQUENT USERS

The vast majority of venue users can be characterized as systematic users: going to public access venues is not a rare event but rather a defining feature of their routines. A great number report going to venues daily or almost daily, ranging from one-third in Chile to one-half in the Philippines (Table 3.18). Including users who visit venues at least weekly, systematic users represent more than three-fourths of users in Chile, close to 80% in Brazil, over 80% in Bangladesh, and over 90% in the Philippines. Frequency has an

impact on the relative types and frequencies of activities users engage in. (See Chapter 5 on the social and economic impacts of public access use.)

Table 3.18: Frequency of public access venue visits (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Daily or almost	41	38	41	33	41	50
At least once a week	43	45	38	43	47	43
At least once a month	10	12	13	11	8	4
A few times a year	6	5	8	13	4	3
Total	100	100	100	100	100	100

Note: n=4,583

PUBLIC ACCESS USERS ARE NOT INEXPERIENCED

Users' levels of experience in using computers and the internet vary widely, generally reflecting the stage and rapidity of ICT adoption in each country: Chile, not surprisingly, has more experienced users than Bangladesh. Less than 10% of users have less than one year of computer experience in Brazil, Ghana, and the Philippines. In Chile the percentage of such novice users is less than 5%, compared to Bangladesh with close to 30% (Table 3.17). Users with over three years of experience account for more than 70% of users in the Philippines, around 75% in Brazil and Ghana, and more than 85% in Chile. In Bangladesh, almost one-fifth are new users (mostly computer users).

Table 3.19: Experience with computers, users of public access venues (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
<6 months	9	24	5	4	6	4
7–12 months	3	6	4	1	2	3
1–2 years	16	23	13	6	17	17
3–5 years	23	18	20	19	26	34
>5 years	49	29	58	70	49	42
Total	100	100	100	100	100	100

Note: n=5,005

Interestingly, not many of the young users (in the 12–15 and 16–19 age groups) are among the new users. The percentage of young users (12–15) with less than one year of experience is highest in Bangladesh, with about 17%. More generally, that percentage ranges from around 13% in the Philippines to under 5% in Chile. Many new users are in the older age ranges, particularly in Chile and Brazil, where recent national policies encourage public ICT usage by older population groups.

Overall, the figures give the profile of rather experienced users, as well as indicating a continuous inflow of new users. These are signs that the use of public access has not peaked. Coupled with demographics that are heavily skewed towards youth and the slow increase in home connectivity, this profile points to the future viability and usefulness of public access ICT venues.

Years of experience do not necessarily translate to high skills: around 60% of users in Bangladesh and the Philippines report that their skills in using computers are less than good, as do more than 30% in Brazil and Chile (Table 3.18). These percentages reflect the youth of the users and, even more, the numbers of new users and the lack of formal training.

Table 3.20: Self-assessment of skills by public access venue users (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Self-assessment of computer skills (n=4,989)						
Poor	8	18	6	6	2	7
Fair	34	43	25	24	24	56
Good	42	33	44	54	47	31
Very good	16	6	25	16	27	6
Total	100	100	100	100	100	100
Self-assessment of internet skills (n=4,673)						
Poor	7	19	4	5	1	7
Fair	30	39	19	20	22	51
Good	44	34	40	57	49	36
Very good	19	8	37	18	28	6
Total	100	100	100	100	100	100

Services and usage

This section presents a summary of findings regarding the services offered by public access venues, as well as the usage of such services.

PUBLIC ACCESS VENUES OFFER A MULTITUDE OF SERVICES

Data from the venue survey indicate that public access venues provide their patrons with a wide range of services (Figure 3.7). In addition to internet access (offered by 99% of venues), the most common services were printing (88%), scanning (69%), CD writing (52%), and document preparation (50%).

Figure 3.7: Services offered at public access venues (all venues)
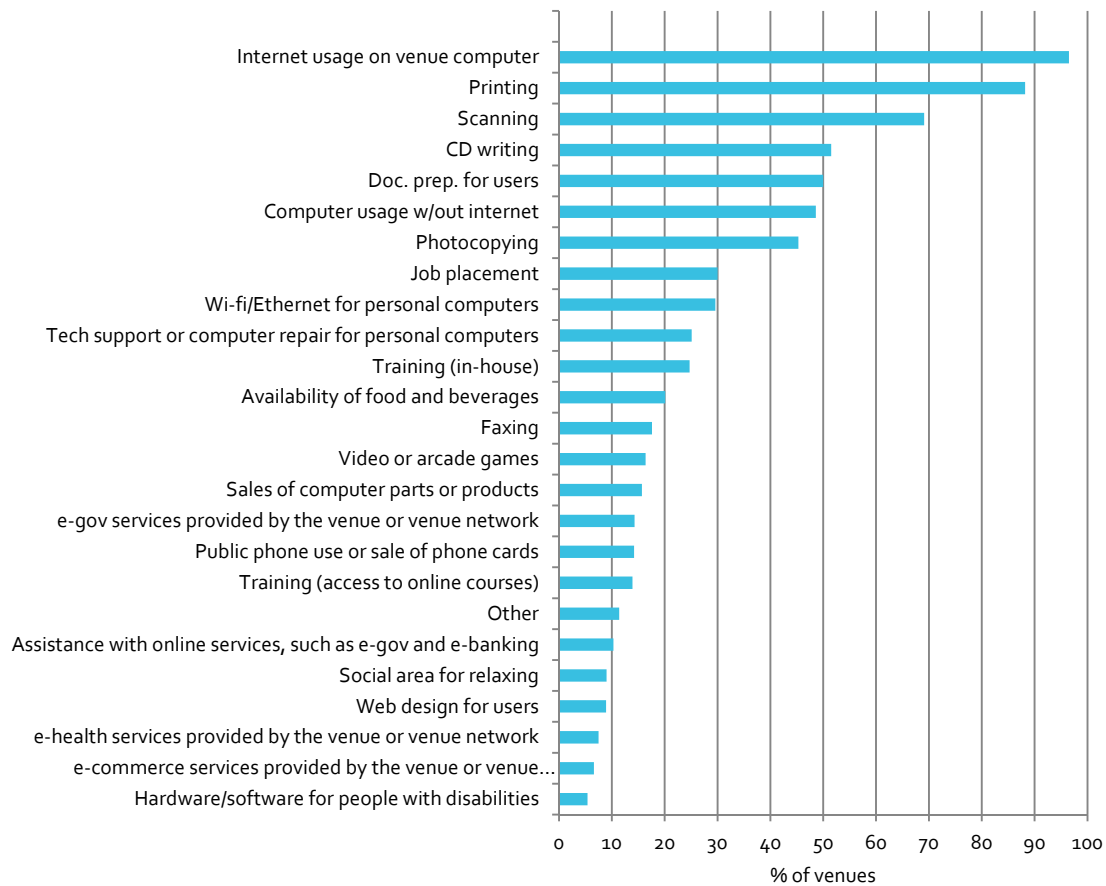
LIBRARIES OFFER A DIFFERENT MIX OF VALUE-ADDED SERVICES

While internet usage and printing tended to be consistently high across all venues, there was considerable variability in other services that perhaps affects users' choices (Table 3.19). A much higher percentage of libraries and telecenters were offering in-house training (about 57% for each) compared to cybercafés (10%). Similarly, job placement services were offered by 55% of telecenters and 46% of libraries but only 19% of cybercafés. Libraries were much more likely than other venue types to offer assistance with online services, such as eGovernment and eBanking (39%), eHealth and eCommerce, and web design for users (25%, compared to 8% among cybercafés and 4% among telecenters). Libraries were also more likely to offer space for social interaction (20%, compared to just over 7% for cybercafés and telecenters). As well, proportionally more libraries were catering to people with disabilities, as indicated by the availability of specialized hardware and software. On the other hand, food and video arcade games were more commonly offered in cybercafés (28% and 21%, respectively) than at other venue types (at around 5% or less).

Table 3.21: Services offered by public access venues (%)

Note: n=4,761.User fees are the norm.

	All	Libraries	Cybercafés	Telecenters
Internet usage on venue computer	97	96	99	90
Printing	88	78	94	76
Scanning	69	52	78	52
CD writing	52	39	53	52
Document preparation for users	50	44	45	68
Job placement	30	45	19	55
Wi-Fi/Ethernet for personal computers	30	30	34	8
Tech support or computer repair for personal computers	25	12	30	16
Training (in-house)	25	57	10	57
Availability of food and beverages	20	4	28	3
Video or arcade games	16	3	22	5
Sales of computer parts or products	16	2	20	10
e-Government services provided by the venue or venue network	14	52	6	15
Training (access to online courses)	14	52	6	17
Assistance with online services, such as e-Government and e-Banking	10	39	6	6
Social area for relaxing	9	20	7	7
Web design for users	9	25	8	4
e-Health services provided by the venue or venue network	8	19	5	9
e-Commerce services provided by the venue or venue network	7	20	4	7
Hardware/software for people with disabilities	5	13	4	4
Hardware rental	4	1	4	6

Many of the services offered tended to come with usage fees. The services that most commonly had fees (across all venue types) were printing (91%), photocopying (78%), scanning (89%), internet usage on

venue computers (84%), and CD writing (78%).[14] Services least likely to require fees were eCommerce (11%), eHealth (12%), social area for relaxing (14%), hardware/software for people with disabilities (16%), and e99Government (17%).

When venue patrons were asked what services they used (besides venue computers), the top items were value-added services: printing (70%), photocopying/scanning (57%), and CD writing (39%). These are services that were much less likely to require a fee at libraries than at cybercafés and telecenters.

USERS OFTEN SEEK INFORMATION

Among users in public access venues, 47% indicated they went to the venue looking for specific information.[15] Information-seeking behavior was higher among visitors to libraries (56%), but users of telecenters and cybercafés were not far behind, at 47% and 46% respectively (Table 3.20).

Again, user behavior varied by country. The country with the highest proportion of individuals seeking specific information was the Philippines (56%), while Brazil was the lowest (28%). There are also country usage differences relating to type of venue. For instance, whereas 89% of individuals in libraries in the Philippines indicated they went to the venue for specific information, only 22% of Brazilian library-goers went to look for specific information. In Chile, the venues with the highest percentage of people indicating that they were looking for specific information were telecenters (70%).

Table 3.22: Users seeking specific information, by venue (%)

	All	Libraries	Cybercafés	Telecenters
All countries	47	56	46	47
Bangladesh	50	56	53	47
Brazil	28	22	27	33
Chile	49	51	46	70
Ghana	46	44	48	32
Philippines	56	89	53	64

Note: n=4,576

EDUCATION TOPS THE LIST OF INFORMATION SOUGHT

Of those individuals who went to the venue looking for specific information, the majority indicated they were looking for education information (58%) followed by entertainment (43%) and employment and

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[14] These data reflect venues that indicated the services are available. Venues without the services are omitted from the analysis.

[15] Note that the question asked specifically about the day of the interview, not going to venues in general. Therefore, the numbers do not reflect the proportion of people who *ever* seek information at public access venues. That value is certainly higher than that for an activity on a particular day.

business opportunities (32%). No other type of information had more than 15% of individuals searching for it. Chapters 4 and 5 take a closer look at usage patterns in the priority domains and for priority populations of the research.

Summary

Data from the Global Impact Study inventory and surveys, complemented with outside sources, portray a complex landscape of public access venues with different business models and services. The types of venues and their characteristics tend to be influenced by national backgrounds and therefore differ between countries. And although the study found that most users are young and highly educated and come from middle income backgrounds, the user story is also complex, with youth, adults, males, females, workers, and more all represented in varying degrees, depending on the country and/or type of venue.

Along with this mosaic of distinct user groups, the study found that actual usage in venues is also quite diversified. Users engage in a variety of activities, including tasks they undertake on behalf of others (non-users). Detailed usage analysis of the different user groups — by age, gender, experience, location, or other characteristics — can provide a perspective on impacts.

Among the range of activities performed at public access venues, information access is an especially important, and perhaps irreplaceable, function of public access venues. Information-seeking behavior was highest among users in libraries, but patrons at all venue types reported using the venues to find specific information, particularly around education, entertainment, and employment and business opportunities. For many individuals, public access venues the only avenue to computer access; for many others, the venues provide unique services and opportunities that cannot be substituted by home computer use or mobile phones.

4.   Digital Inclusion: Opening Doors

Digital inclusion is the most obvious and directly observable impact that public access venues have on users. For the purposes of this study, digital inclusion is defined as *having access to the physical and human support tools that people need in order to participate in an increasingly digital world*. Opinions differ about how narrowly or broadly to define digital inclusion (see for example Seale, 2009). For analytical purposes this report distinguishes between digital inclusion and social inclusion outcomes, while recognizing that the two are often closely intertwined. The Global Impact Study defines digital inclusion to cover more than mere physical access to technology, but not to include outcomes that are generally out of the direct control of the public access venue. The latter types of impacts are categorized as social and economic impacts, which can be considered pointers to the achievement of social inclusion. Separating digital inclusion from social inclusion simplifies analysis, allows for clearer identification of the contribution of public access venues, and, importantly, acknowledges that digital inclusion does not automatically lead to social or economic inclusion.

Digital inclusion can be facilitated in different ways through different technologies and institutional structures. Here the focus is on computer and internet technologies — specifically the computer-based facilities and services that public access venues offer — to examine the extent to which these resources contribute to bringing populations into the information society at the level of basic access and use of these two technologies. This inclusion may be direct or indirect, and it may be purposeful or incidental, but it is an important foundation for inclusive forms of social participation. Public access venues whose primary goal is to provide access to computers and the internet (such as cybercafés) are especially well placed to deliver this impact. For other venues, such as libraries and telecenters, providing access to ICTs may be considered rather a means to serve broader social goals. These venues deliver digital inclusion impacts incidentally, in the course of targeting social inclusion impacts. In both cases, it is important to recognize digital inclusion as a legitimate impact of public access ICTs.

Data from the five country surveys (as well as most of the in-depth case studies) show three distinct areas of this first-order effect:

1.   Technology access
2.   Information access
3.   Development of ICT skills

This section discusses findings on the nature of these digital inclusion outcomes, showing that public access venues are a critical source of basic access to computers and the internet, in addition to serving as foundational ICT training grounds for low- and middle-income populations.

Technology access

Public access ICT venues have made computer and internet technology accessible to a large population of users who would otherwise have limited or no access to computers and related technologies. Even with the growing levels of mobile phone adoption and the associated potential of the mobile internet in

low-income communities, it is evident that computer and internet access challenges have not been completely eradicated in those communities.[16]

For more than half of the user survey respondents, a public access venue provided them with their **first ever contact with computers (50%) and the internet (62%)**. This signals the importance of public access in preparing people for entry into the digital information society. Figure 4.1 shows that for first computer use, the proportions were in the range of 33%–60%. Even in Chile, with the highest national penetration of computers and internet use of the countries surveyed, the figures for first computer use were high. The pattern is even stronger for internet use: in the two poorest countries, Bangladesh and the Philippines, two-thirds and three-fourths of responders first used the internet at a public access venue.

Figure 4.1: First use of computer and internet at a public access venue
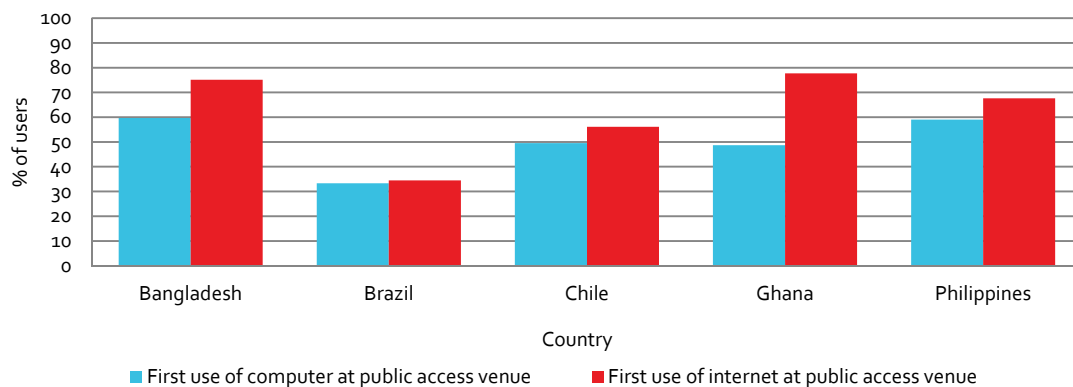
Users with lower socioeconomic status (based on personal income and educational level) were somewhat more likely than those with higher status to have first used computers and the internet at a public access venue (Figures 4.2 and 4.3). Overall, higher proportions of those with incomes below the poverty line had first used computers at a public access venue (66%, compared to 34% of those above the poverty line); a similar pattern holds for first internet use (66% compared to 34%). A similar trend can be seen for educational level, although the differences are smaller than for income level. In light of the generally higher-than-average income and educational levels of public access users (Chapter 3), this finding provides an important additional perspective. Although public access venues attract larger numbers of more well-to-do users, they play a particularly essential "first touch" role for people at lower socioeconomic levels.

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[16] See the Global Impact Study report on use of the mobile internet in South Africa (Walton & Donner, 2012).

Figure 4.2: First use of computers and internet at a public access venue, by income level
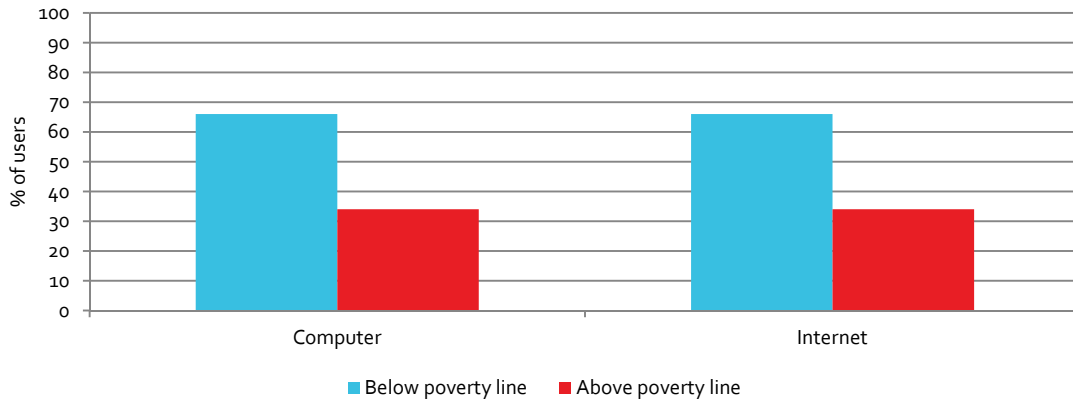
Figure 4.3: First use of computers and internet at a public access venue, by educational level
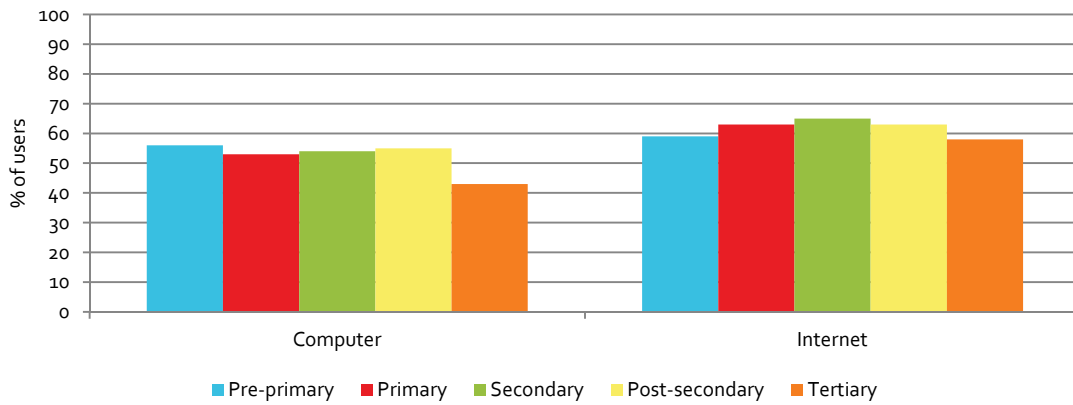
Female users (53%) were also more likely than male users (49%) to have had their first contact with a computer at a public access venue (Figure 4.4), although the difference was not large (Figure 4.4).

Figure 4.4: First use of computers and internet at a public access venue, by gender
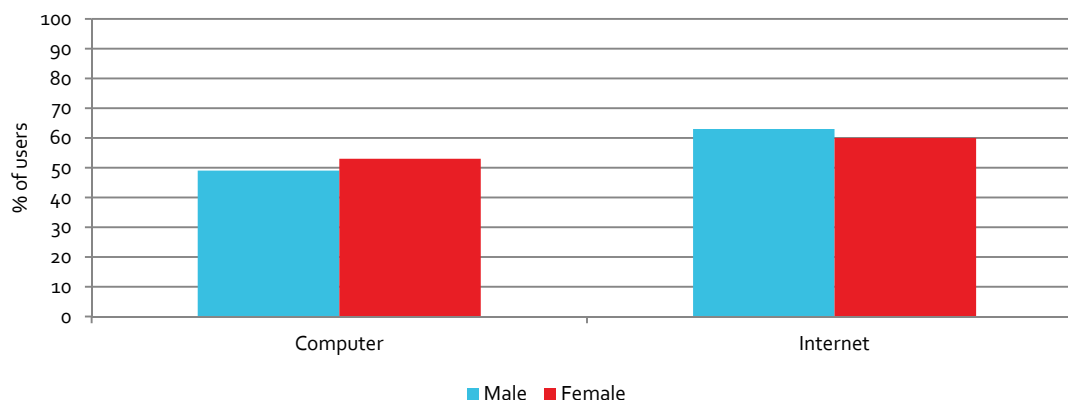
Furthermore, **public access venues were the only source of access to the internet** for at least a third (33%) of survey respondents (Table 4.1). This was particularly important for cybercafé (36%) and library (35%) users. For many users, public access venues were their only source of access to computers — about one-seventh (15%) of all users, and an even higher proportion of telecenter users (26%, versus 12% and 13% for cybercafé and library users).

Table 4.1: Main reason for using a public access venue (%)

	All	Libraries	Cybercafés	Telecenters	Other
No other option for internet access	33	35	36	19	30
To work or be with friends or other people	18	10	20	13	16
Better equipment than home or work	15	16	17	8	15
No other option for computer access	15	13	12	26	14
To get help from venue staff	7	6	3	23	7
To get help from other users	2	4	2	3	2
Other	10	16	10	8	16
Total	100	100	100	100	100

Notes: n=4,790. This table captures the central reason for using public access venues and does not imply that this is the only reason. Survey respondents were asked to select only one option. Thus, indicating that internet access is the main reason for using a venue does not mean that other reasons do not also apply. These figures represent the *minimum* proportion of users with a particular reason.

Table 4.1 also shows that sometimes using ICTs at public access venues is more affordable or more convenient than other options. "Better equipment than home or work" was the third most important

reason for using public access, especially for cybercafé (17%) and library users (16%).[17] This study concludes that public access venues are relevant even for people who have alternative means of accessing ICTs (e.g., at home, work, or on a mobile phone). Such users may be driven to public access use by limitations of their personal access, whether technical (quality of computer hardware, bandwidth, access to peripheral equipment, or software availability), economic (e.g., high cost of mobile data), or social (e.g., lack of privacy at home or conducive environment to socialize with peers).[18]

Perhaps the most direct indication of the impact of public access venues on technology access can be seen in users' response to the possibility of losing this access. *The majority of respondents* (over 55%) *would use computers less if public access venues were no longer available*. Telecenter users would be especially hard hit, with almost 80% indicating that their use of computers would decline, followed by library users (59%) and cybercafé users (49%). The numbers are particularly stark for Bangladesh: almost all respondents said their use of computers would decline if public access venues were no longer available (87% total, including 100% of library users and 93% of telecenter users). For the other countries, between 37% and 55% said their use would go down.

On the other hand, a fairly high proportion of users in three of the countries said they would maintain the same level of computer use if public access venues were no longer available: 56% in the Philippines, 47% in Chile, and 46% in Brazil, compared to 12% and 36% for Bangladesh and Ghana respectively. The evidence suggests that ICT access in Bangladesh (and to a lesser extent, Ghana) is much more constrained than in the other three countries, so that public access venues may be the only option many users find available to them. Public access venues provided the only source of ICT access to a relatively lower proportion of users in Brazil (28%) compared to the other four countries, where the percentage ranged from 47% to 59%. Overall, users in Bangladesh and Ghana seemed most dependent on public access, while users in Brazil seem to be least dependent.

Information Access

Beyond first making it possible to access the physical technology, public access ICT venues provide a gateway to livelihood-related and other types of information. In so doing, they expand users' alternatives for acquiring information, and in some cases, may be the only avenues for some types of information to be found.

Information access was explored by asking users whether they had come to the venue to look for information, as well as whether they had performed certain information search activities at a public access venue and what outcomes they had achieved. The results indicate that *users see public access venues as places where a broad range of information needs can be met.* On the day they were surveyed, almost half of users (47%) had come to the public access venue to look for specific information (That

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[17] An equal percentage reported "no other option for computer access."

[18] See Chapter 7. See also the Global Impact Study reports on the mobile internet in South Africa (Walton & Donner, 2012) and on interpersonal communication and public access ICTs in the Philippines (Alampay, forthcoming).

proportion was relatively low in Brazil, at 28%.) Information interests spanned social, economic, and political purposes and varied across different types of venues (Table 4.2).

Table 4.2: Type of information sought at public access venues (%)

	All	Libraries	Cybercafés	Telecenters
Education	58	63	62	42
Entertainment	43	31	49	23
Employment and business opportunities	32	20	33	38
News	29	25	31	20
Government services	11	16	9	15
Health information	10	13	10	13
Culture and language	9	15	8	7

Note: n=1,990

Library and cybercafé users were most likely to be looking for education information (63% and 62% respectively); education information also topped the list among telecenter users, albeit at a lower rate (42%). Entertainment was quite high in cybercafés, at 49%, and it was the second category among libraries, at 31%, and the third among telecenters, at 23%. Some of these differences may be explained by the restrictions that are often placed on such activities in libraries and telecenters.[19] Information-seeking concerning employment and business opportunities was proportionally higher in telecenters (38%), also strong in cybercafés (33%), and somewhat less so in libraries (20%). Information-seeking on government services was lowest in cybercafés, while news (local and international) was the lowest among telecenter visitors.

Levels of search activity varied across different domains. The general trend was that those looking for information in a particular domain of activity tended to find it, and a majority also tended to put that information to use and/or to experience some gain. This outcome was 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 underlines the value of public access venues as information gateways. This outcome is discussed further in Chapter 5.

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[19] For discussion of the value of playful uses of ICTs, see Chapter 7 as well as the Global Impact Study report on non-instrumental uses (Kolko, forthcoming).

ICT skills

The third contribution public access venues make to digital inclusion is in promoting the development of ICT skills — helping users build the knowledge and skills they need to use computer hardware and software and to navigate internet resources. These skills are part of the foundation for digital literacy. Digital literacy itself is a complex construct, encompassing a range of indicators. For example, Eshet-Alkalai (2004) conceptualizes it as a collection of five social and cognitive skills — namely, photovisual, reproduction, branching, information, and socioemotional — and develops measures to test for these skills. In contrast, Rissola and Centeno (2010, p.18) define digital literacy as "critical and confident use of ICT, including: ability to participate in social networking applications and in collaborative environments, awareness of security threats and risks, and also ability to use ICT for creative and innovative purposes, irrespectively of the context."

For the purposes of the Global Impact Study surveys, contribution to the development of ICT skills is assessed by asking users where their computer and internet skills were developed, without delving into specifics about what types of skills have been obtained. ***Users identified public access venues as the most important place for development of their computer (40%) and internet (50%) skills*** (Table 4.3).

Table 4.3: Most important place for developing ICT skills (%)

	Computer skills	Internet skills
Public access venue	40	50
Home	23	18
School	23	17

Note: n=4,979

The trends for socioeconomic status were similar to the data on technology access. Users with lower personal incomes and lower educational levels showed a higher tendency to identify public access as the most important place for developing their computer and internet skills (Figures 4.5 and 4.6).

Figure 4.5: Public access venue as most important place for developing skills, by income level
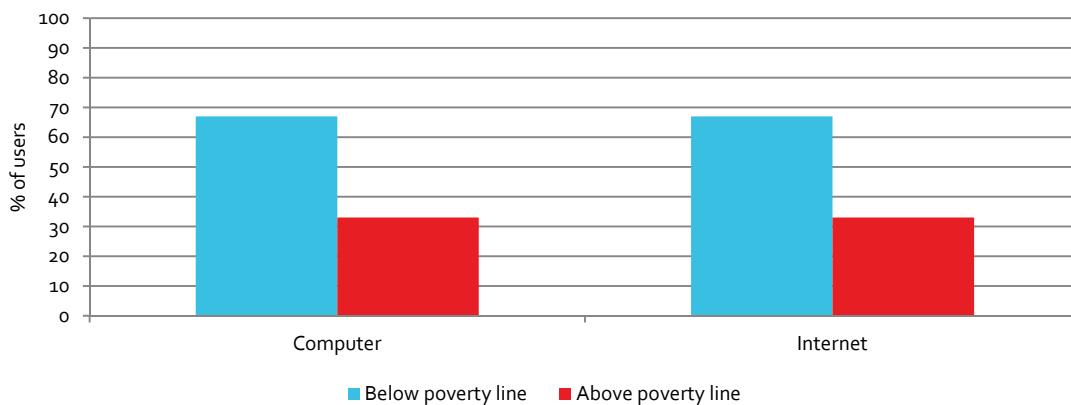
Figure 4.6: Public access venue as most important place for developing skills, by educational level
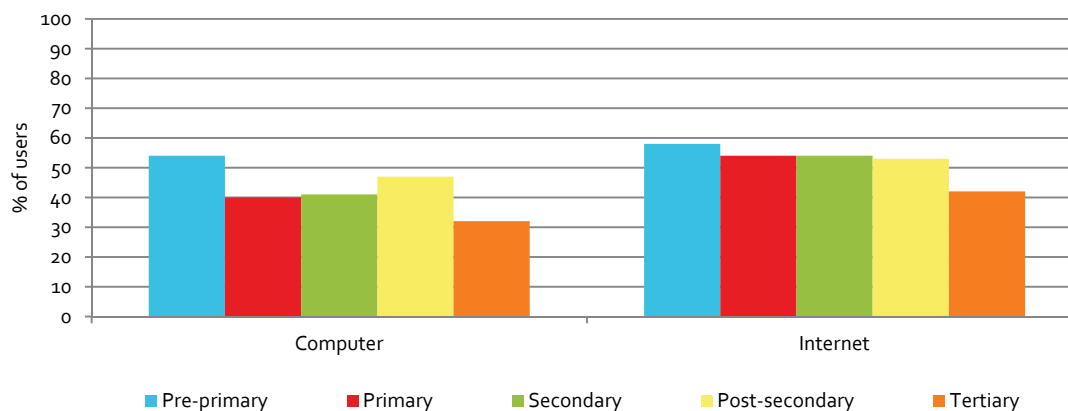
Public access venues were important digital learning grounds for both male and female users, topping the list of most important places for both genders (Table 4.4).

Table 4.4: Most important place for computer and internet skill development, by gender (%)

Venue	Computers (n=4,912)		Internet (n=4,606)	
	Male	Female	Male	Female
Public access venue	41	35	54	44
School	22	28	16	22
Home	22	23	16	20
Friend's house	8	7	7	8
Work	7	7	7	6
Total	100	100	100	100

Infomediation

Apart from providing access to ICT equipment on which users can teach themselves digital skills, public access venues also have staff members who can support users with technical or informational needs. This function of public access venues is generally associated with libraries and telecenters, but it is not necessarily absent from profit-oriented venues such as cybercafés.[20] A number of questions in the user survey explored the use of this support facility. The data suggest that, when set against the need for

[20] See Chapter 7 as well as the Global Impact Study report on infomediaries for examples (Ramirez, Parthasarathy, & Gordon, forthcoming).

basic technology access, seeking staff assistance was not a highly ranked reason for using public access venues. (But see the discussion below regarding the unique case of Bangladesh.)

Overall, 7% of users indicated that getting help from venue staff was their main reason for using a public access venue, and about 16% said they seek staff assistance frequently (every time or most times they visited a venue). Requests for help were most often related to problems with internet connectivity (45%), computer software (19%), and computer hardware (16%) (Figure 4.7).

Figure 4.7: Most common type of staff assistance sought
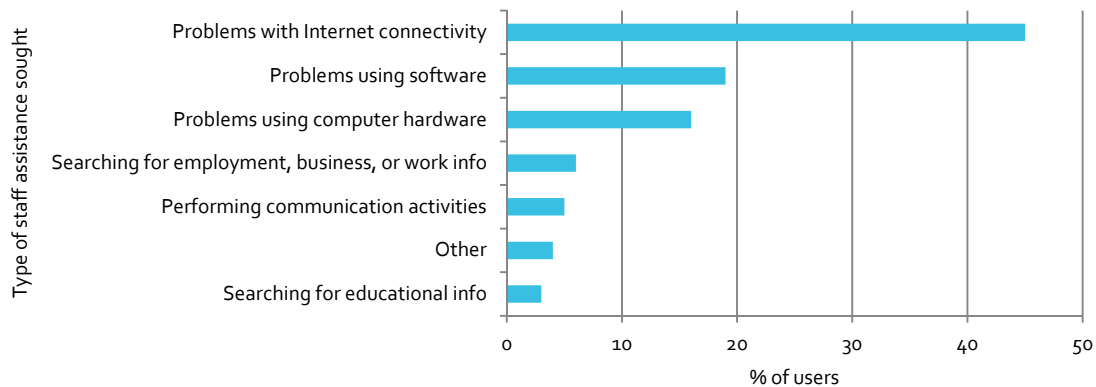
Not surprisingly, the most important staff qualities cited related to their technical skills — knowledge and skill in hardware use (33%) and skill in software use (26%). Somewhat less important were the softer skills — information searching (17%) and empathy (10%) (Figure 4.8). ***The overwhelming reason why users did not seek help from venue staff was that they did not* need *help (90%)***.

Figure 4.8: Reasons for seeking assistance from venue staff
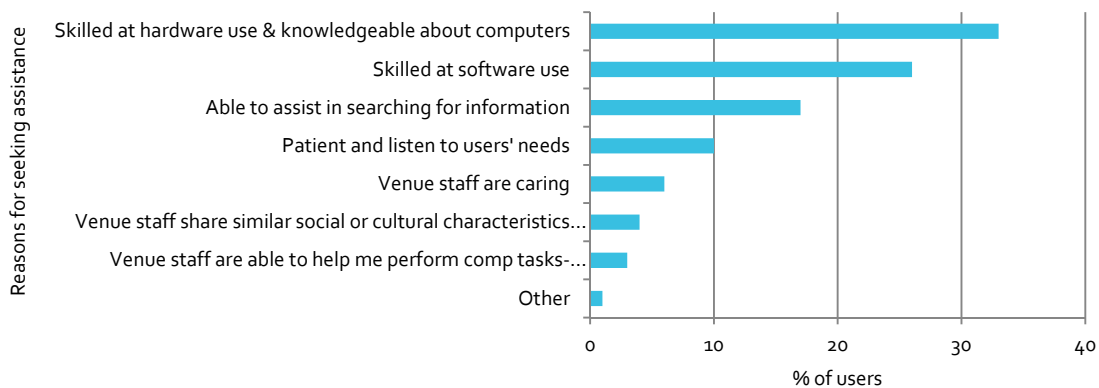
Bangladesh presents a deviation from the general trend, both in reasons for going to public access venues and in the frequency of seeking assistance from venue staff. Overall, a relatively small proportion of users cited seeking staff assistance as their primary reason for using public access — but a majority (60%) of these responses came from Bangladesh and from telecenter users. This point illuminates the

central role of public access in Bangladesh, while also highlighting the complex relationship between country context and venue type (specifically telecenters and libraries).

As noted in Chapter 3, public access users in Bangladesh tended to have the shortest history of experience with both computers and the internet, and were more likely to rate their skills at lower levels than other users (poor or fair). Thirty percent reported less than one year of computer experience, compared to 4%–8% for other countries. One-quarter reported less than one year of internet experience, compared to 4%–13% for other countries. It makes sense then, to find that 22% of respondents from Bangladesh said their main reason for going to a public access venue was to get help from venue staff (compared to 3%–5% for other countries). Moreover, a much higher proportion of respondents from Bangladesh (43%) sought venue staff assistance very frequently (every time or most times they visited a venue) (Figure 4.9).

Figure 4.9: Frequency of seeking assistance from venue staff, every time or most times, by country
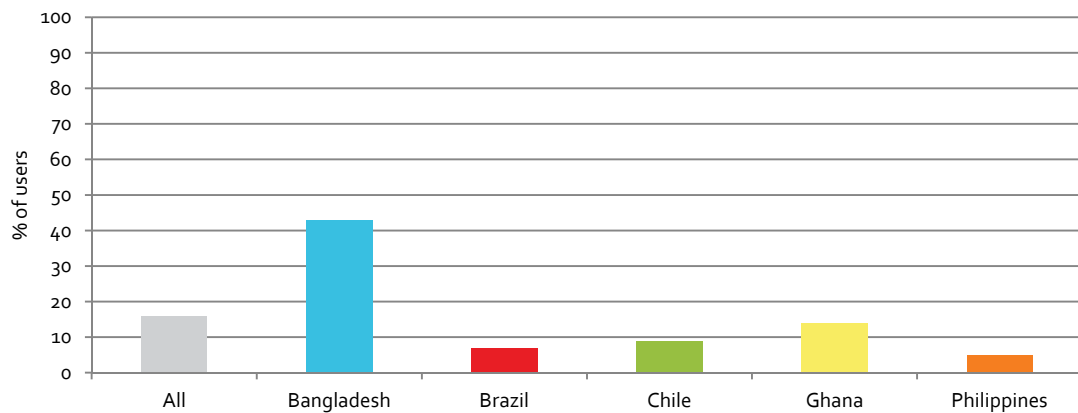
The data also show that 64% of telecenters users in the survey were in Bangladesh, and that telecenter users were more likely to indicate that their main reason for going to a public access venue was to get assistance from venue staff (23%, compared to under 7% for library and cybercafé users). Telecenter users were also more likely to cite public access as the most important place for developing their computer and internet skills (59% and 64% respectively, compared to 33% and 41% for library users and 35% and 49% for cybercafé users).

These findings provide context for the technology access discussion: telecenter users' top three reasons for using public access were computer access, help from venue staff, and internet access (Table 4.1). These priorities of telecenters users, most of whom are in Bangladesh, are particularly relevant in a country that is still in the relatively early stages of computer and internet diffusion. Conversely, for library users, the top three reasons for using public access venues were internet access, better equipment, and working with friends, suggesting a context in which higher levels of familiarity with computer and internet technologies allow a shift to purposes that transcend simple access. Indeed, 71% of library users in the sample were in Chile, with a higher rate of home computer and internet access, and libraries that are relatively well-resourced with public access computing facilities. In the Bangladesh/telecenter context, this trend highlights the importance of **public access venues as sources of assistance for novice computer and internet users.**

An in-depth study on sharing practices in Ghana — which has the second highest incidence of public access users seeking assistance from venue staff — provides additional support for the importance of infomediaries for users with less familiarity with ICTs.[21] The study found that cybercafé users generally turned to venue staff for help when they encountered a problem they could not resolve on their own. Consistent with the broader findings illustrated in Figure 4.7, 86% of respondents in the in-depth study stated that they ask the venue staff for technical assistance if they have a problem with the computer systems.

The staff support services offered by public access venues were valued not only by users in Bangladesh and Ghana. Seeking staff assistance, while not the primary reason most public access users went to a venue, was cited as *an important criterion for selecting which venue to use.* More than half (53%) of all users cited as a very important factor that "venue staff are knowledgeable and helpful," in choosing which public access venues to visit (Figure 4.10).

Figure 4.10: "Very important" factors in choosing which public access venue to go to
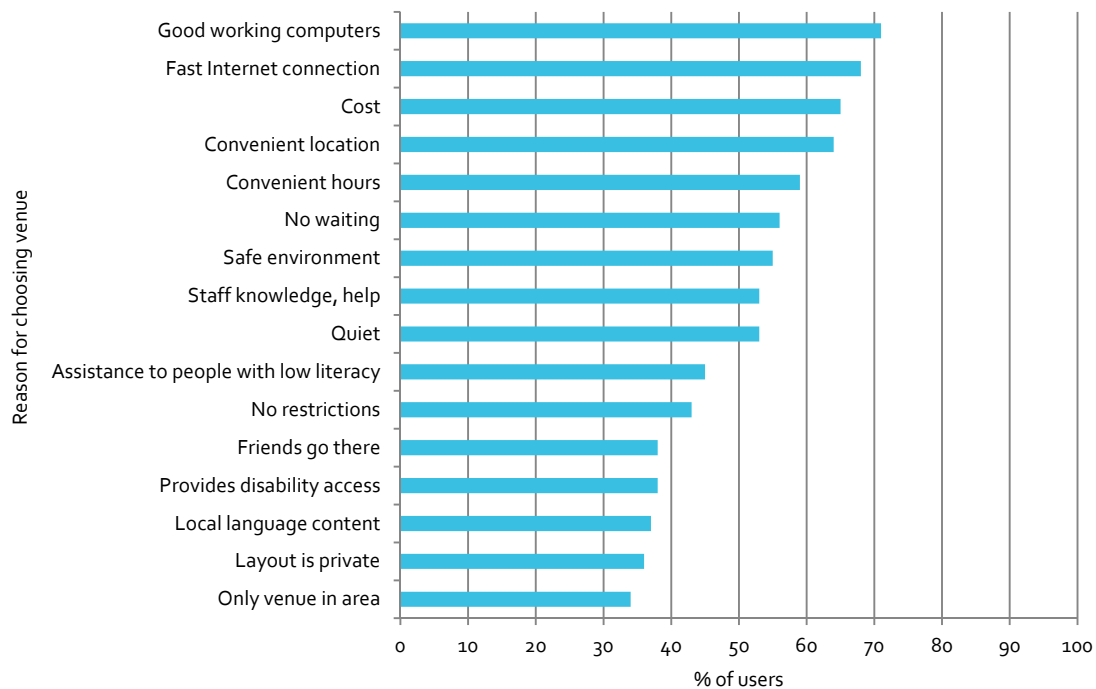
An in-depth study of Bangladesh, Chile, and Lithuania provided confirming evidence of the higher value attached to infomediaries in Bangladesh. Importantly, they also showed that both novice and experienced users valued the services of an effective infomediary, for both technical and non-technical support. The in-depth study showed that, while technical abilities of the venue staff were consistently

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[21] See Chapter 7, as well as the Global Impact Study report on collaborative knowledge sharing (Best et al., 2012 forthcoming).

rated as more important than their empathy, empathy was still considered important by both novice and advanced users.

Summary

Public access facilities contribute to digital inclusion by bridging a variety of digital divides. They expand access to ICT infrastructure and to a variety of information resources, and they support the development of ICT skills. Libraries, cybercafés, and telecenters alike were an important source of basic access to ICTs. They provided the first ever contact with computers and the internet for more than half of the users surveyed, and they served as the only source of access to the internet for at least a third of users.

Public access venues were also effective information gateways for users: over 90% of respondents looking for information found what they were looking for. Finally, public access contributed to ICT skill development, with a large proportion of users identifying public access venues as the most important places for development of their computer and internet skills. The role of public access in facilitating digital inclusion is underscored by the finding that over 50% of users would see a reduction in their use of computers if public access venues were no longer available. While these benefits were enjoyed by all public access users, they appear to have special significance for users from relatively low socioeconomic backgrounds.

5. Beyond Access: Social & Economic Impacts

Introduction

Access to technology and information resources and basic digital literacy skills, the first order effects, are essential prerequisites for experiencing impacts of ICT access in social and economic life. But does public access to ICTs in fact generate second-order effects—impacts on education, employment and income generation, civic engagement, or other areas of social and economic activity?

In answering this question, the study examined a number of categories of activity that fall within the study's priority domains of Culture & Language, Education, Employment & Income, Governance, and Health. Communications & Leisure is also included, with special attention the role of email and social networking in building ICT skills and achieving specific tasks.

Due to the complex relationship between user needs, computer and internet usage, and downstream impacts, the study employs a number of analytical approaches to illuminate the nature of the impacts and how far-reaching they extend within different population groups.

The chapter begins with a general discussion of users' perceptions of social and economic impacts. This is followed by a deeper analysis of impacts across the priority domains and user populations.

Impact domains and categories

The six impact domains (listed above) are used throughout this chapter to present usage data. However, a more fine-grained classification was needed to assess impact (particularly in the Communications & Leisure and Employment & Income domains). The impact domains are therefore supplemented by 13 impact categories — eleven categories within the six domains, plus two cross-cutting impact categories, *financial savings* and *time savings*. The cross-cutting categories are relevant to all domains: for example, people might save money by spending less to obtain a particular government service. The domains and categories are shown in Table 5.1.

Table 5.1: Impact categories and domains

CATEGORY	DOMAIN
Communication with family & friends	Communications & Leisure
Pursuing interests & hobbies	Communications & Leisure
Meeting new people	Communications & Leisure
Pursuing other leisure activities	Communications & Leisure
Income	Employment & Income
Access to employability resources	Employment & Income
Sending or receiving remittances	Employment & Income
Education	Education
Health	Health
Access to government information & services	Governance
Local language & cultural activities	Culture & Language
Financial savings	Cross cutting
Time savings	Cross cutting

Impact is measured in two ways:

1. The proportion of users experiencing positive, negative or no impact from their use of public access venues (in the 13 impact categories)
2. The proportion of users who have been able to successfully pursue particular information-seeking and communication goals at public access venues (within the six domains)

General impact perceptions

Table 5.2 gives an overview of users' perceptions of impact across the 13 impact categories. Overall, **98% of users reported a positive impact in one or more of the 13 categories.** This finding includes people who had not recently used a public access venue in the particular category of activity.

Table 5.2: Overall impact from using public access computers (%)

	Positive	No Impact	Negative
Communication with family & friends	83	16	2
Education	79	20	2
Pursuing interests & hobbies	76	21	3
Meeting new people	74	24	3
Pursuing other leisure activities	68	29	4
Time savings	58	30	12
Access to employability resources	58	40	2
Financial savings	41	40	20
Access to government information & services	41	56	3
Local language & cultural activities	36	61	4
Health	38	56	7
Income	35	55	10
Sending or receiving remittances	23	72	5

Note: n=5,010

Over 50% of users reported positive impacts of public ICT access in their *communication with family & friends*, *meeting new people*, *education*, *pursuing interests & hobbies or other leisure activities*, *time savings*, and *access to employability resources*. The dominance of positive social and leisure-related impacts confirms a common narrative about public access use — that they are hubs for social networking and leisure pursuits (Sey and Fellows, 2009). Maintaining *communication with family &friends* tops the list, with 83% of users reporting positive impacts. But note that this first tier of positive impacts also includes areas related to education and employment, two of the priority impact domains.

A high proportion of users (25%–40%) also reported positive impacts on their *financial savings*, *access to government information & services*, *local language & cultural activities*, *health*, *income*, and *sending or receiving remittances*. This second tier of impacts relates almost entirely to areas of traditional concern to international development, i.e., the priority domains of Health, Education, Governance, Culture, and Employment.

The highest negative impacts were associated with expenditures of time or money: *financial savings* (20%), *time savings* (12%), and *income* (10%). These users may have been reflecting on how much it costs them, in time and money, to use public access venues.

This first cut at the data appears to confirm prior research suggesting that people experience the most impact in the areas of communications and leisure. Nevertheless, impacts in other areas — *education, health, access to employability resources*, among others — remain extremely important, even if they appear less frequently in user responses. A closer look at the data shows a complex dynamic of usage and impacts. (See also Chapter 9, Public Access in a Development Context, for a discussion of "routine" vs. "episodic" uses.)

Usage patterns and impact

Table 5.2 shows high proportions of "no impact" reports in a number of domains, including those of priority concern to international development. A key question is whether the 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 benefits in these domains. To answer this question, first impacts between those who engaged in a particular domain (defined as use within the last 12 months) were compared with those who did not. Second, reasons for non-use were examined.

The highest proportions of positive impacts, in almost all domains, were reported by people who had used that domain in the last 12 months (Figure 5.1). For example, almost 70% of those who had used the venue in the last 12 months for health reasons (sometimes, most times, or every time), either for themselves or for others, perceived positive impacts, compared to 25% of those who had not. Frequency of use was particularly important. ***All domains showed a dramatic increase in positive impact perceptions for the users who more frequently used a venue for that domain.***

Figure 5.1: Frequency of use and perception of positive impacts, by domain
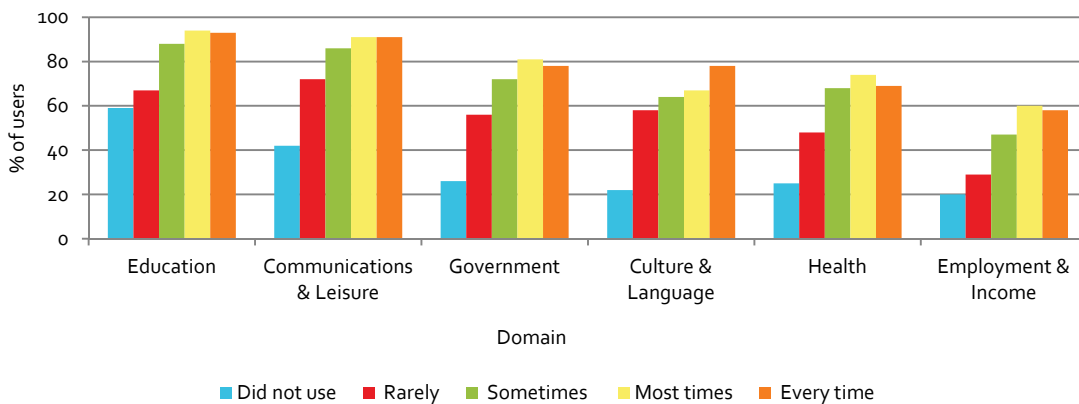
The results confirm the relationship between goals/needs and positive impact perceptions: those who came to the venue to seek information in a particular domain were more likely to perceive positive impacts in that domain. Staying with the health example, 82% of those who came to the venue to look for health information perceived positive overall health impacts, versus 42% of those who were not looking for health information.

Notably, non-use (in the previous 12 months) apparently did not mean an absence of impacts. People who had not used a venue for a specific domain still reported positive impacts, ranging from a high of 60% in Education to about 20% in Employment & Income. The explanation could be that respondents

were thinking of a narrow set of activities when responding to the question about use of a particular domain. Or, it could be that some respondents were recalling an earlier time (prior to the past 12 months) when they experienced positive impacts. This would suggest that there may be some diffused and lingering forms of public access impacts.

Reasons for non-use

The second approach to understanding the incidence of "no impacts" was to examine why people did not use public access computers for a given domain. Respondents were given ten options. Across domains, the overwhelmingly dominant response was "didn't have the need" (Figure 5.2).

Figure 5.2: Reasons for non-use, by domain
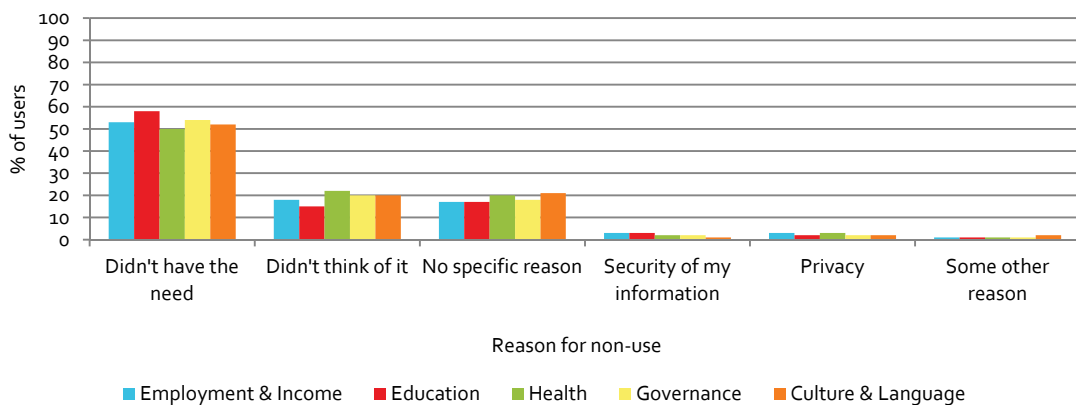
Note: Only the top six reasons are shown. The other four reasons all scored under 2% of responses: Venue doesn't have equipment; Cost; Limited help; and Venue policies.

Of course, non-use is not necessarily a bad thing: people who are not unemployed or unwell are likely not to be searching for a job or trying to find medical information. Moreover, the demographic composition of public access users — mostly young — would affect their impact responses. As a group, they may be less susceptible to illness, as well as (perhaps unfortunately) less engaged in civic and cultural activities.

At the same time, the high number of responses, "didn't think of it," could indicate that many users were unaware of the information resources available, or that those resources were not available. Public access venues might need to enhance their efforts at making users aware of the available resources and potential benefits.

Goal achievement and impact

Among those users who did engage in goal-oriented activities, how many actually achieved what they set out to accomplish? To probe goal achievement, a three-part logical question structure was used. For each priority domain, respondents were asked: (1) Did you search for information? (2) Did you find information? (3) Did you take action based on that information?

This structure is informed by two approaches to impact measurement. *Outcome mapping* (Earl, Carden, & Smutylo, 2001) is an evaluation framework that supports linking program activities to changes in the

behaviors, activities, and relationships of program users. By focusing on "outcomes," this approach identifies the *contribution* to development goals, without claiming causality. The *situated logic* model (Naumer, 2009) is an approach to evaluation that links program activities to high-level policy priorities (or development goals).

The analysis found support for the effectiveness of public access ICT as a resource for people pursuing specific goals. Across all priority domains, an overwhelming number of respondents were able to proceed through the progression of steps to achieve what they set out to do.

Figure 5.3 shows the proportion of users who engaged in each of the priority domains within the previous 12 months. Large percentages were engaged in all domains, and particularly in Education (66%) and Employment & Income (42%).

Figure 5.3: Proportion of users engaged in priority domains
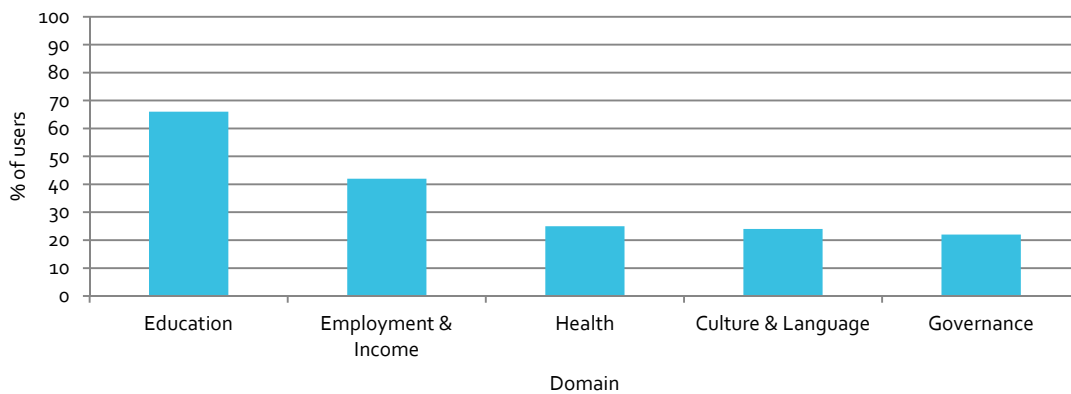
For each subset of the sample — those engaged in each of these five domains — a follow-up exercise examined how successful they were in satisfying information needs or completing key tasks, from two to four per domain. The assigned tasks are considered very common in all the countries studied, though they do not represent the full range of activities commonly performed in these areas and show only some of the tasks that public access users might engage in. Task completion, usually indicated by some action, marks the end of the activity sequence "search, find, act."

Figures 5.4 through 5.8 show each task broken down into a series of steps. This demonstrates how task completion is not independent, but rather an outcome of other activities such as searching for information and finding information. Here, researchers specifically examine whether users actually followed through from information seeking to accomplish a task. Specifically, the figures show the number of users who engaged in each task (by domain), and the number who successfully completed the steps for that task. (Note that the charts show absolute numbers rather than percentages. The total number of respondents was 5000.)

Figures 5.4 through 5.8 show that an overwhelming proportion of people were able to complete the tasks they came to the public access venue to do — over 80% in each case. For example, the first block of Figure 5.4 shows that, out of 5,000 respondents, 1091 said they had searched for jobs. Of that group 1,027 (over 90%) said they found information on jobs. Of those 1,027, over 90% actually applied for a job.

Figure 5.4: Tasks attempted and completed, employment & income domain
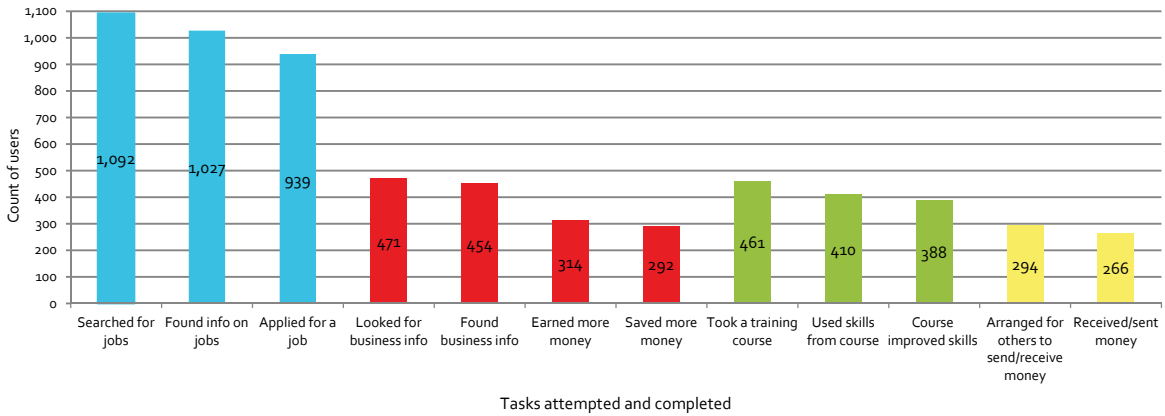
Figure 5.5: Tasks attempted and completed, education domain
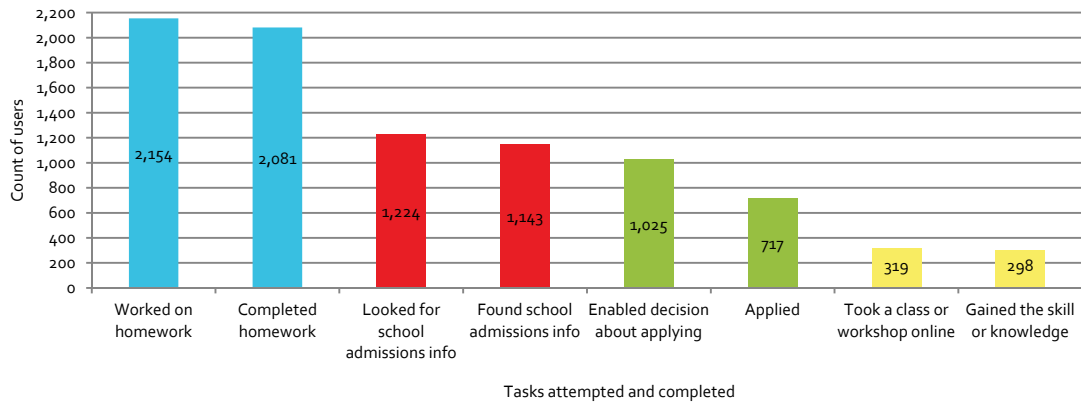
Figure 5.6: Tasks attempted and completed, health domain
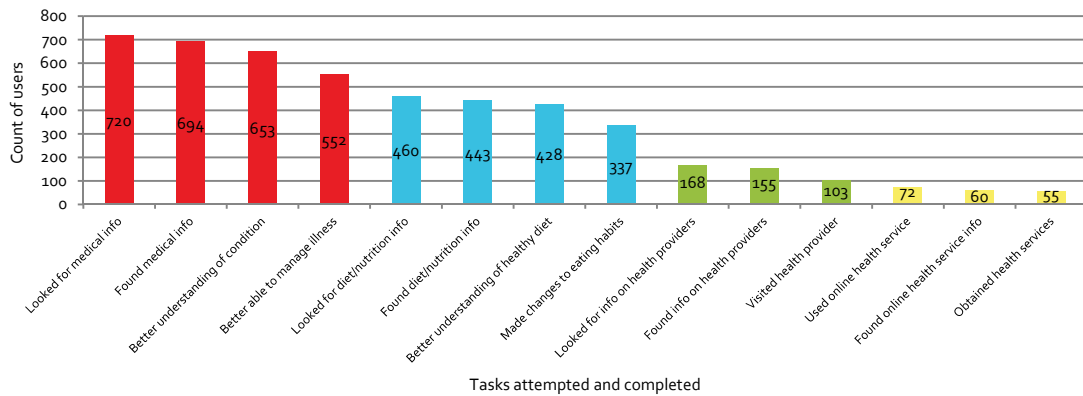
Figure 5.7: Tasks attempted and completed, governance domain
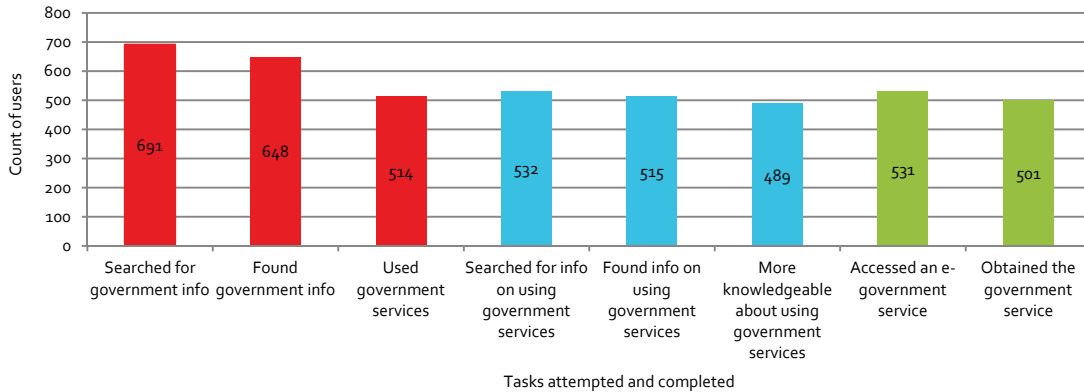
Figure 5.8: Tasks attempted and completed, culture & language domain
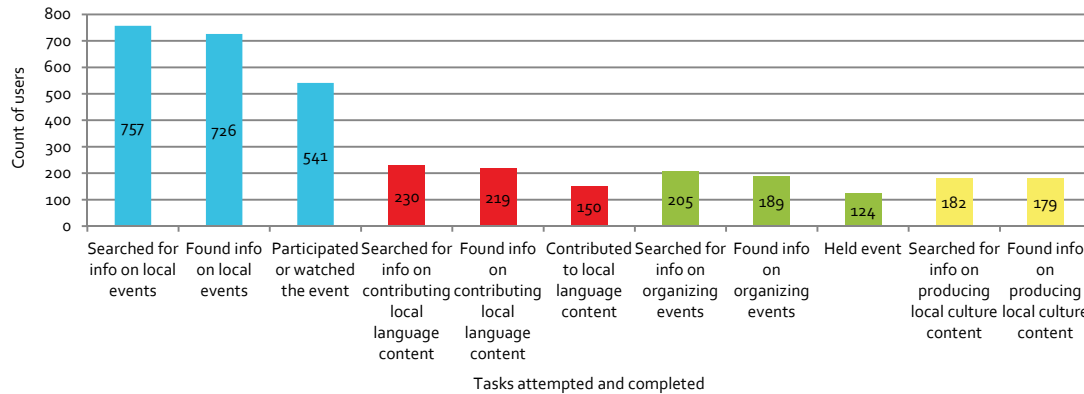
Usage patterns and impacts cannot be isolated from users' needs and goals, as well as the availability of needed resources at the point of use. For example, considering the large number of students in the survey sample, it is not surprising that homework and searching for admissions information appeared as high priorities in the Education domain, as compared to taking an online course or workshop.

A number of interesting questions arise in this context. For instance, what factors enabled people to accomplish the attempted tasks with such high rates of success? What venue characteristics contribute to success, e.g., the presence of trained staff to assist users? Did all user groups achieve their goals equally, or are there differences among them? While they are beyond the scope of this report, these questions might be explored using the data collected.

Impacts by venue type

The analysis turns to whether these impacts were experienced equally across the three venue types. While the country variations in the distribution of libraries, telecenters, and cybercafés presents some analytical complications, some interesting features emerge from a general cross-venue analysis.

When users were asked whether they had used public access venues to access specific domains in the last 12 months, library and cybercafé users had a higher level of use over all domains, than telecenter users (Figure 5.9). In the highest-use domains — Communications & Leisure and Education — library and cybercafé users reported similar levels of use. Library users showed higher levels of use in the domains of Culture & Language, Health, and Governance.

Figure 5.9: Use of domains, by venue type
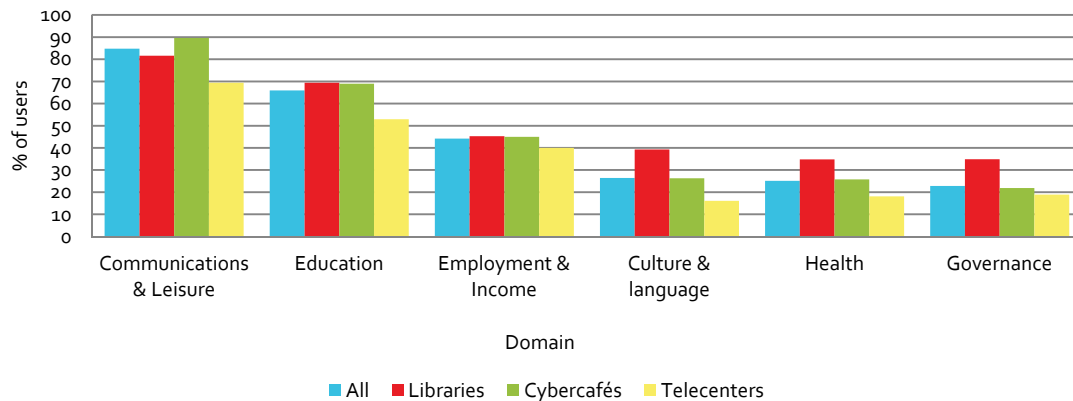
Note: P-value < 0.0001 for Communications & Leisure, Employment & Income, and Governance

When users were asked how often they had accessed each domain over the past 12 months, the picture became more complex. Three domains — Communications & Leisure, Employment & Income, and Governance — showed significant (P-value < 0.0001) differences in frequency of use. The other three — Culture & Language, Education, and Health — did not show significant differences.

Figure 5.10 shows overall perceived impact across the 13 impact categories. Again, higher proportions of library and cybercafé users showed positive impacts than did telecenter users. But in this case, there are greater differences — favoring libraries — between libraries and cybercafés than for usage. In other words, although library and cybercafé users have generally similar usage patterns, ***more library users report positive impacts than cybercafé users.*** Library users were more likely to report positive impacts than the other two venue types in the areas of *education*, *time savings*, *access to government information & services, local language and cultural activities*, and *health*. In only three areas (*communication with family & friends, meeting new people, pursuing leisure activities*), higher proportions of cybercafé users reported positive impacts than library users, though by much smaller margins. Overall, lower proportions of telecenter users reported positive impacts, with some notable exceptions (*access to employability resources, financial savings*).

Figure 5.10: Perceived positive impact, by venue type
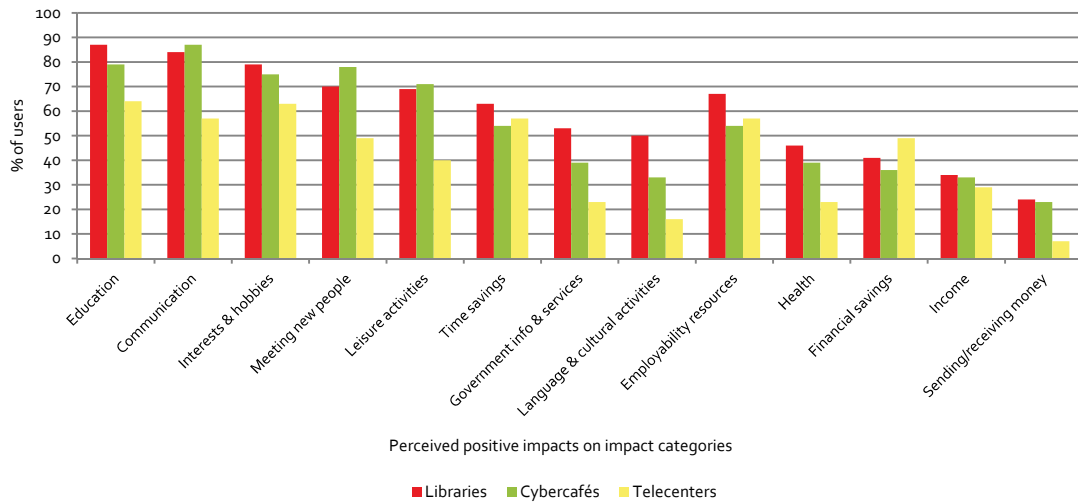
Note: P-value = 0.0054 for Education and 0.007 for Communications & Leisure

Impacts by user population

This section examines how different user populations perceive impact, sorted by socioeconomic variables — employment status, income level, and education level — and by gender, age, and location (urban or rural). Particular attention is given to findings for the populations of greater interest: lower socioeconomic status, females, older adults, and rural users.

EMPLOYMENT STATUS

In order to compare employed and unemployed users, the sample for analysis excluded the categories of students, retired workers, homemakers, and "other." It also excluded both the youngest and the oldest age categories, focusing instead on the two age categories that were mostly likely to constitute a working cohort (25–34 and 35–49) — people who had likely finished their education and were not yet approaching retirement. The resulting sample included 1,060 employed users and 180 unemployed users, in the 25–49 age range.

For usage, the data showed that *a higher percentage of unemployed users were engaged in all priority domains,* as compared to employed users (Figure 5.11). The greatest statistically significant differences were in the Education (P-value = 0.0054) and Communications & Leisure (P-value = 0.007) domains. In other domains, the differences were in the same direction but were not statistically significant.

Figure 5.11: Domain usage, by employed vs. unemployed users
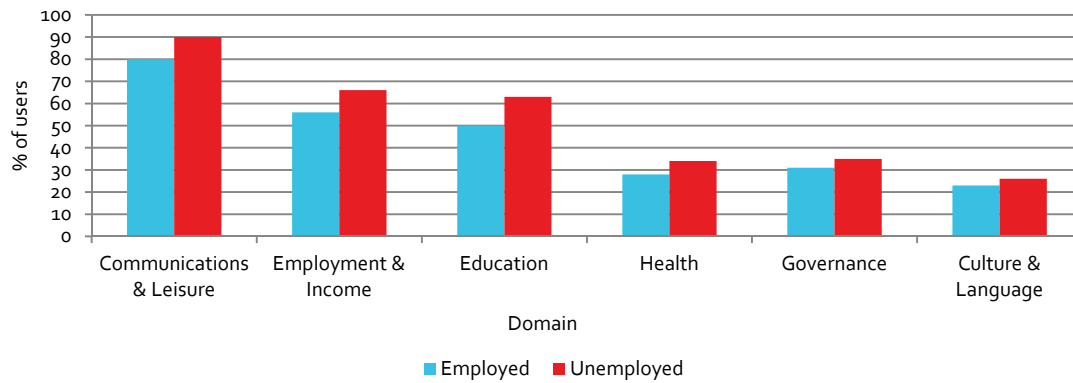
Regarding perceived impacts, ***there was little difference between employed and unemployed users.*** Only one category showed a significant difference between the two groups — "maintaining communications" with family and friends (P-value = 0.024), where a higher percentage of the unemployed group reported positive impacts (61% vs. 49%). Other categories showed smaller differences that did not test significant.

Figure 5.12: Impact on employed vs. unemployed users, communications & leisure domain
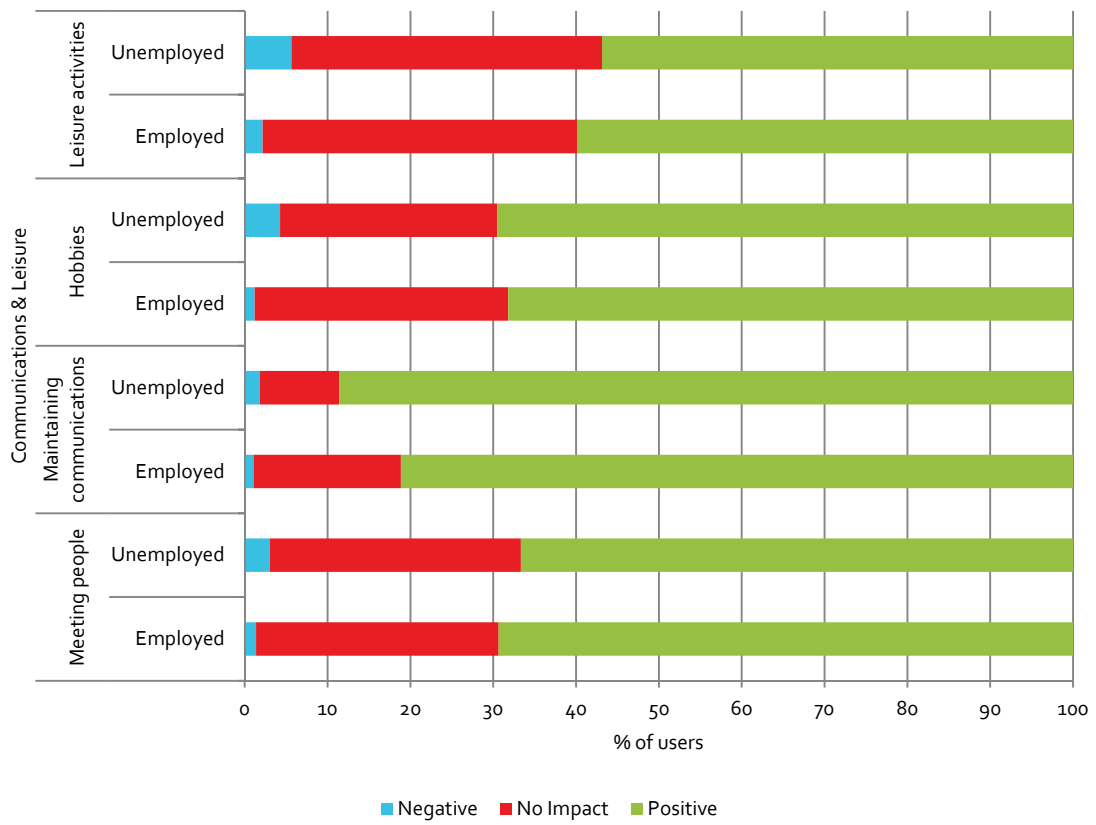
Note: P-value for maintaining communications = 0.024

Figure 5.13: Impact on employed vs. unemployed users, culture & language domain
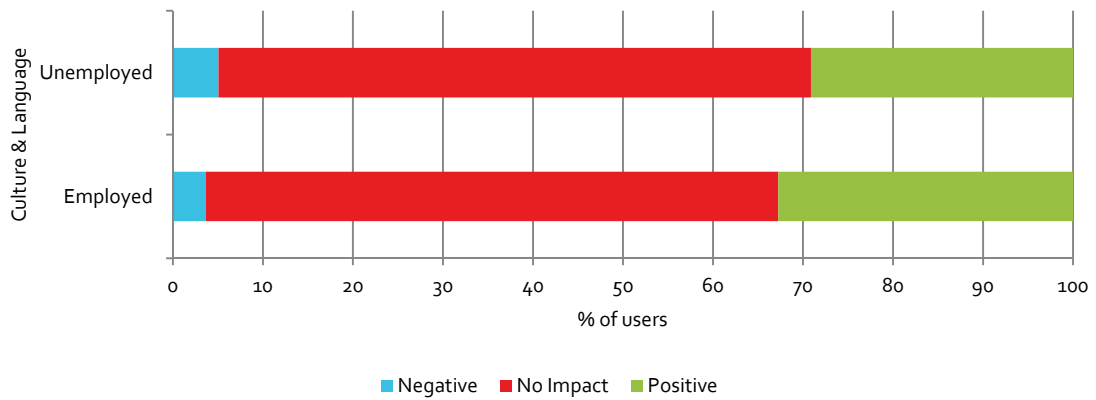
Figure 5.14: Impact on employed vs. unemployed users, education domain
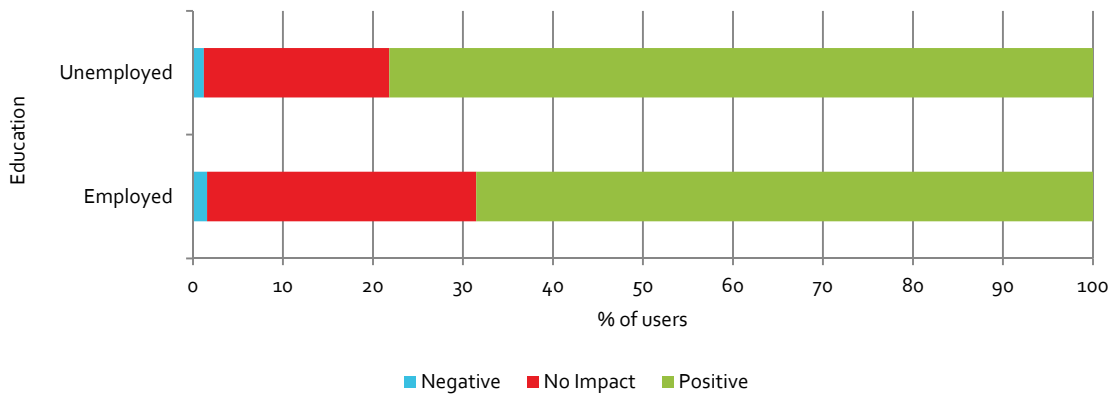
Figure 5.15: Impact on employed vs. unemployed users, employment & income domain
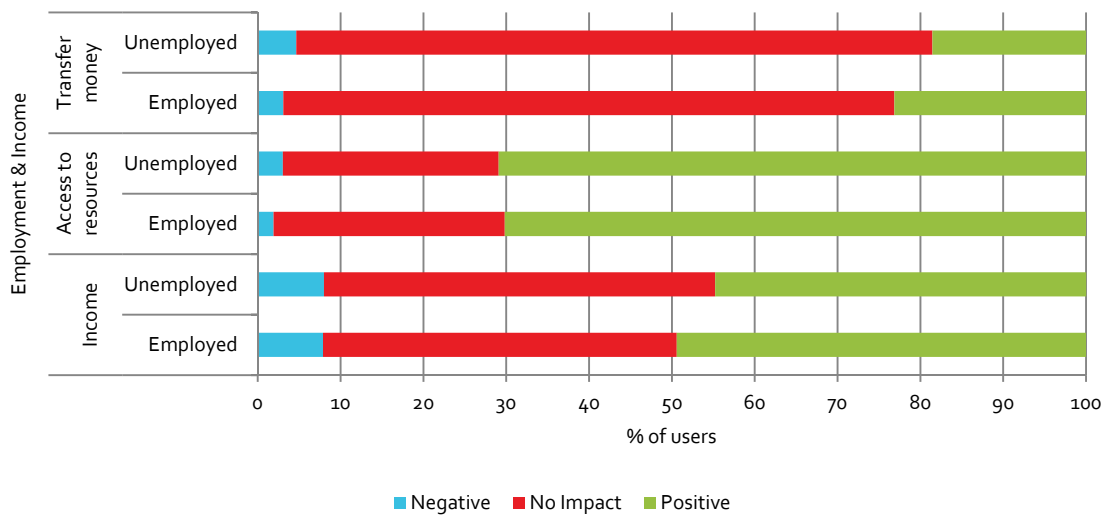
Figure 5.16: Impact on employed vs. unemployed users, governance domain
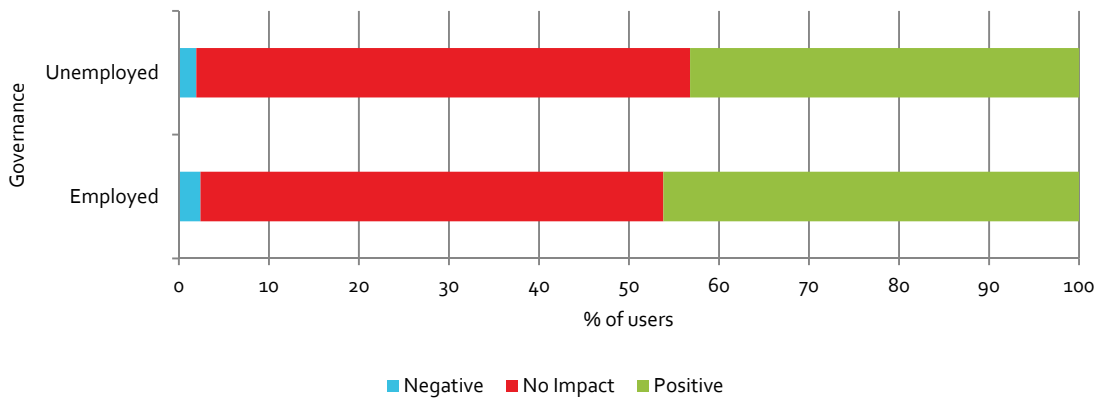
Figure 5.17: Impact on employed vs. unemployed users, health domain
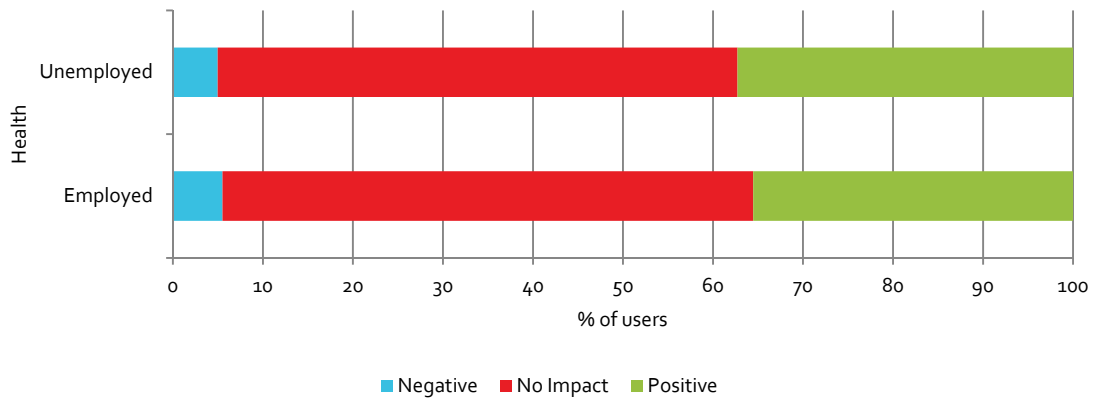
Figure 5.18: Impact on employed vs. unemployed users, cross cutting
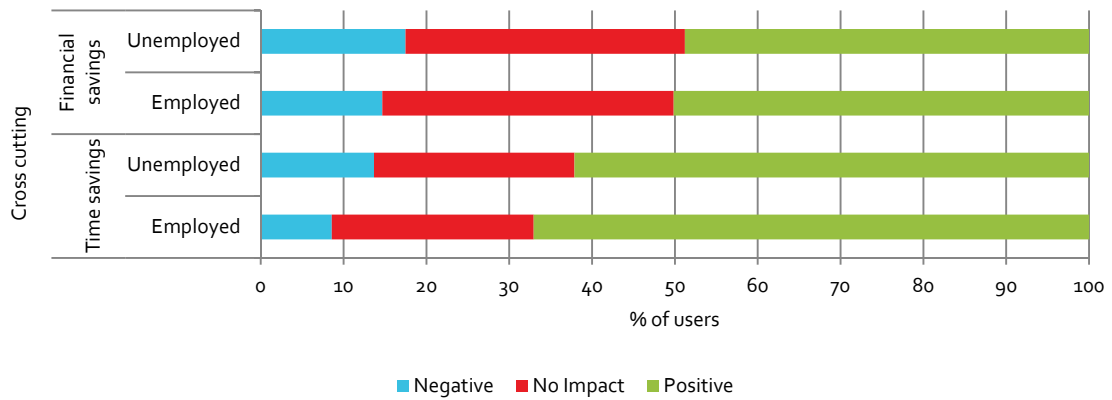
How should these findings be interpreted? One possible reason for the overall similarity in perceived impacts is that the small sample size for unemployed users makes it more difficult to show statistical significance. Still, the fact that unemployed users were as likely as their employed counterparts to report positive impacts in Employment & Income gives support to a principal justification for supporting public access programs. Employed and unemployed people probably use public access to similar degrees but for different reasons, with different impacts in this domain. For employed users, the impacts may be in the provision of resources that help them improve their performance at work or earn more income. For the unemployed, the impacts might include access to information and resources that enable them to network with potential employers or that help to prepare them to re-enter the job market. The absolute scores on positive impact for the unemployed group, across all categories, suggest that public access indeed makes a difference for this vulnerable population. Further analysis of the data can yield more insights.

INCOME LEVELS

This section examines the effect of income on perceived impacts, paying particular attention to those at the lower end of the income spectrum — the most vulnerable population. Users were identified as either above or below the national poverty line (based on personal income), and further classified by employment status: "employed" (full time, part time, or self-employed); "unemployed" (either looking or not looking for a job); and "student." The result is six economic groups (see Table 5.3.) The "student" group was likely to report no personal income, and thus be classified as below the poverty line. Not surprisingly, employed users were more likely to be above the poverty line (76%), while unemployed users were more likely to be below it (78%). (Further analysis will include consideration for gender and age: for the employed-below-poverty group, for example, the gender split was 38% female and 62% male.)

Table 5.3: Users below/above poverty line, by employment status (%)

	Below poverty line	Above poverty line	Total
Employed	24	76	100
Unemployed	78	22	100
Student	90	10	100

Note: n=4,138

Table 5.4 shows the percentage of users in each of the six employment groups reporting positive impacts, for each of the 13 impact categories. In relation to poverty status, the analysis reveals only minor differences in the percentages reporting positive impact. That is, except for the student group, users below the poverty line generally perceived positive impacts to the same extent as those above the poverty line, over all the impact categories. For students, however, higher percentages of those above the poverty line reported positive impacts in all categories — much higher, in some categories.

For *education*, the student group (both below and above the poverty line) was most likely to report positive impacts (85% for those below the poverty line and 87% above it). Unemployed users were the next most likely to report positive impact on *education*, at 80% for those below the poverty line and 71% for those above.

In the category of *health* impacts, the employed group below the poverty line had the highest proportion reporting positive impacts, at 43%, as compared for example to employed users above the poverty line, at 32%.

Table 5.4: Percent of employed and unemployed users reporting positive impact, by category (%)

	Employed, Below poverty line	Employed, Above poverty line	Unemployed, Below poverty line	Unemployed, Above poverty line	Student, Below poverty line	Student, Above poverty line
Income	42	46	36	34	20	38
Access to employability resources	68	67	60	63	39	63
Education	69	67	80	71	85	87
Health	43	32	38	32	33	34
Access to government information & services	44	42	38	40	26	42
Local language & cultural activities	30	34	30	39	27	43
Time savings	52	64	53	51	50	73
Financial savings	40	48	36	46	33	49
Meeting new people	74	69	74	68	72	79
Communication w/ family & friends	81	82	88	86	79	88
Sending or receiving remittances	23	20	20	18	19	25
Pursuing interests & hobbies	75	70	70	72	77	78
Pursuing other leisure activities	68	57	61	60	67	71

Note: n=4,138

Finally, users above the poverty line (employed, unemployed, and student) were more likely to report positive impacts on *financial savings* than those below the poverty line (ranging from 46% to 49%, as compared to 33% to 40%).

Overall, substantial percentages of the lowest income groups — those below the poverty line — report impacts in a number of areas of importance to their well-being, including the key instrumental categories of *employability resources* and *education*.

EDUCATION LEVELS

Previous studies have found that public access users tend to be more educated than the general population, as also noted in Chapter 3. Overall, the data show that the higher their level of education, the more active users tended to be, in specific domains.

Usage increased with increasing education levels in two domains (Employment & Income and Governance). For the other four domains (Communications & Leisure, Culture & Language, Education, and Health), there was more variability. For example, college educated users were especially likely to use public ICT access for Health and Employment; trade school educated users were least likely to use public access for Education.

Figure 5.19: Public access usage, by education level and domain
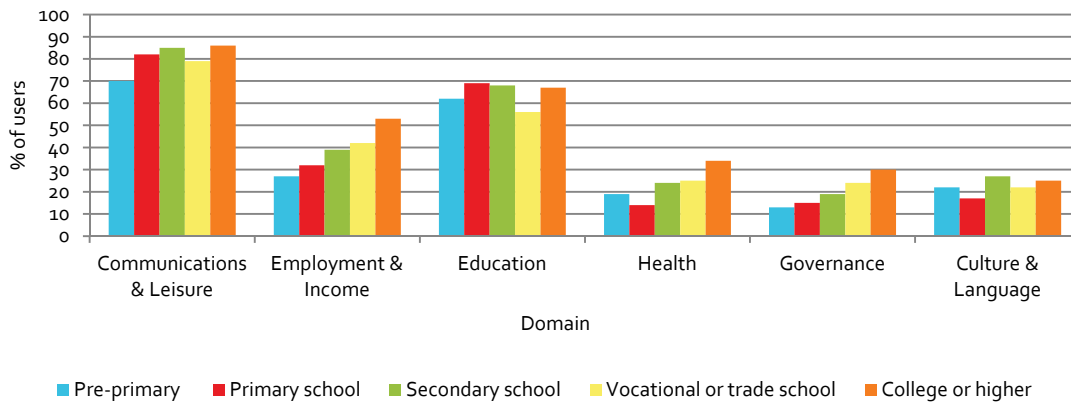
For perceived impact as well, ***perceptions of positive impact increased with the education level of users.*** Moving from grade school to high school to college education level, there was a generally consistent increase in the proportions of respondents at each level reporting positive impacts, for most of the 13 impact categories.

This trend was less evident for certain categories, such as *pursuing interests & hobbies*, *pursuing leisure activities*, *meeting people*, and *maintaining communication with family & friends*. However, for most of the key instrumental categories — *income, access to employability resources, education, health, government information & services*, and *time savings* — the proportions of positive impacts generally increased with education level. Note that these categories are in the specific areas of higher priority to international development. Figures 5.14 to 5.16 illustrate this trend in three key areas: *employability resources, health,* and *government information & services*.

Figure 5.20: Users reporting positive impact on employability resources, by education level
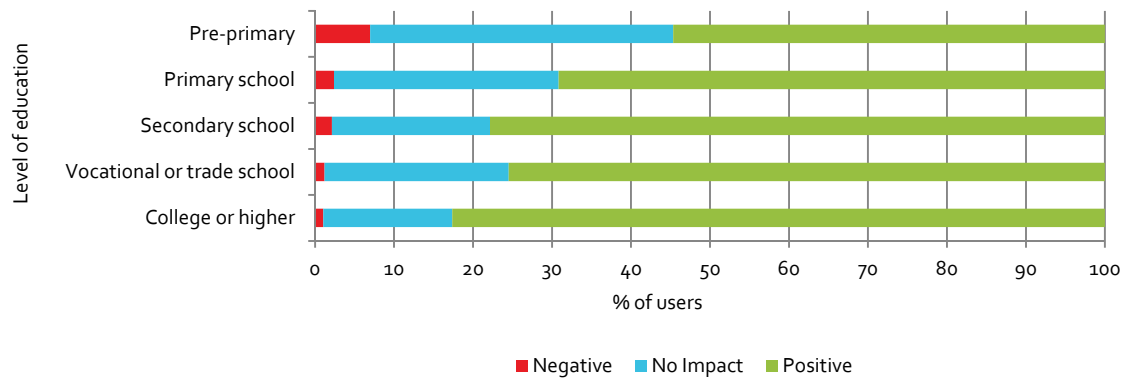
Figure 5.21: Users reporting positive impact on health, by education level
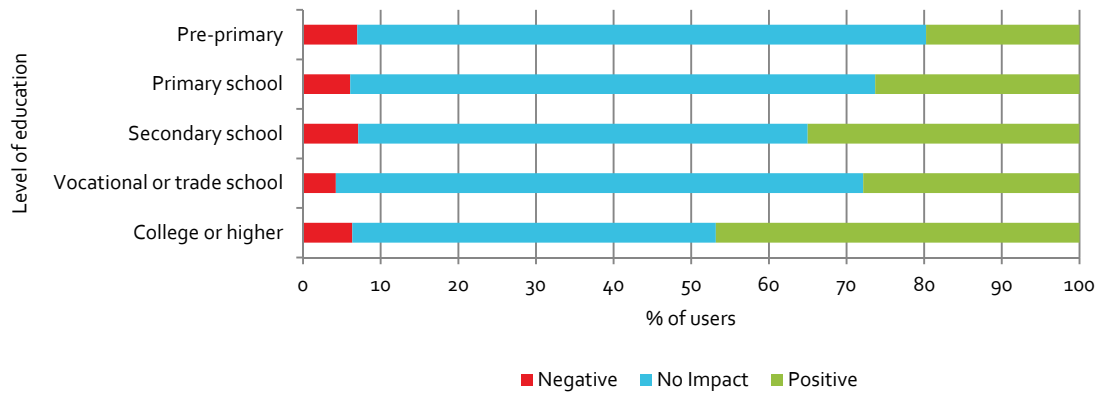
Figure 5.22: Users reporting positive impact on government, by education level
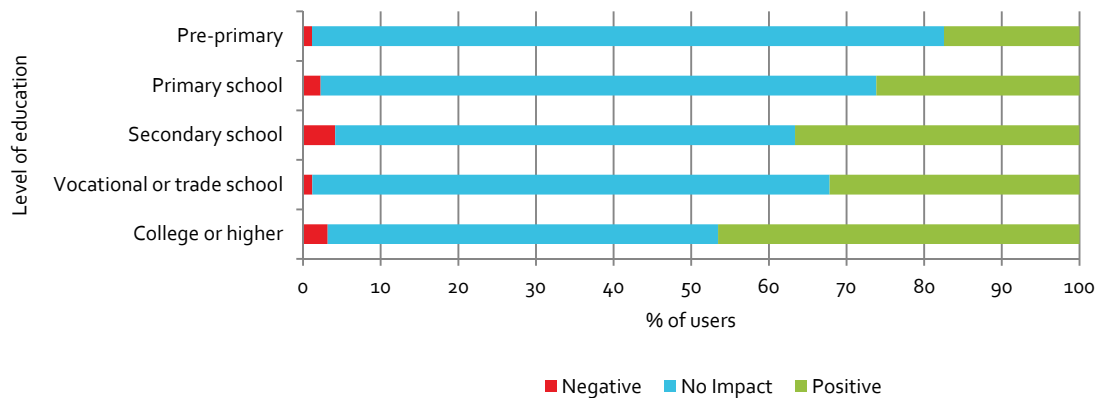
An exception to this overall trend is the pattern of responses from trade school educated users, who often had a lower percentage of reports of positive impacts as compared with either high school or college level respondents (but higher percentages than high school level respondents for some

categories). One possible factor is that many high school students are preparing to enter college, making them more similar to college level users than trade school users. Overall, however, there seems to be a relationship between education level and perceived impacts of using public access venues.

GENDER

The survey design aimed at sampling females and males in equal proportion, in order to have a sizable female sample for statistical analysis — although this strategy would not reflect the actual proportion of female versus male users. Unfortunately, the goal of stratifying equally by gender was not achieved in some countries, notably Bangladesh and Ghana, perhaps because there are actually low numbers of female users in these countries.

Overall, while there were some statistically significant differences by gender, they did not indicate dramatically different perceptions of impacts. Figure 5.17 shows impact categories by gender, with two rows for each of the 13 impact categories, showing male and female responses.

Figure 5.23: Perceived impacts, by gender, communications & leisure domain
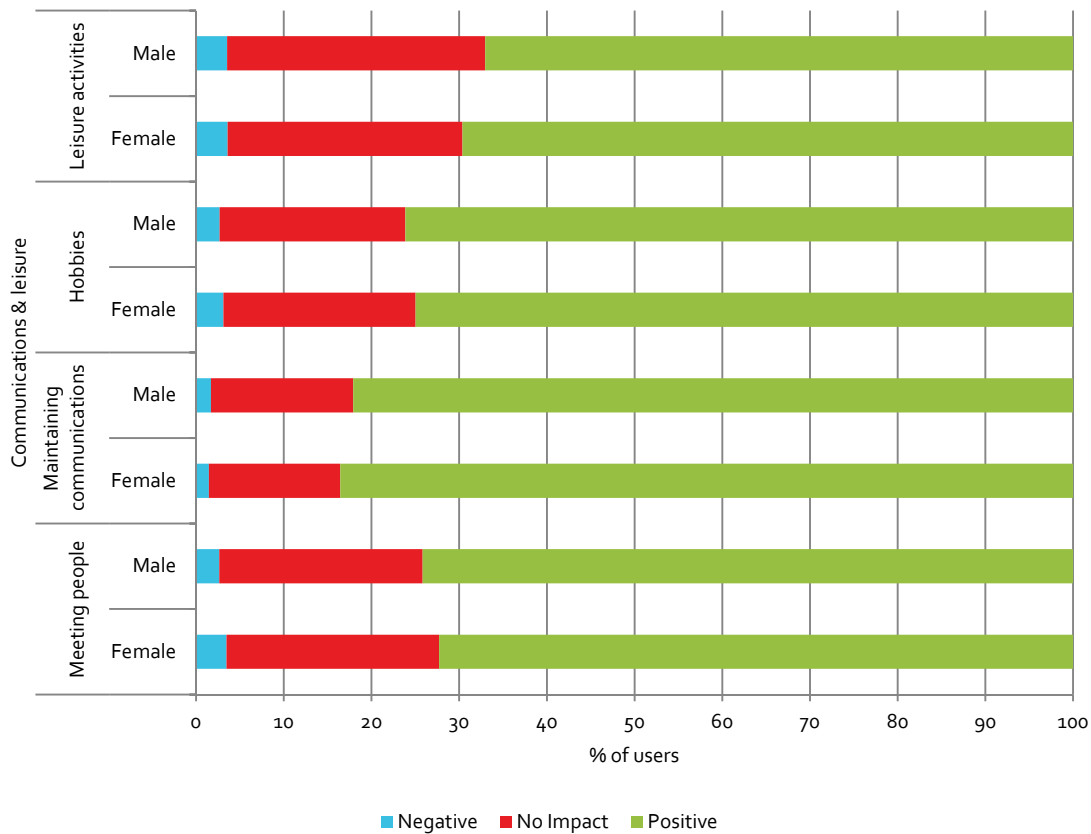
Note: P-value for leisure activities = 0.0831, P-value for hobbies = 0.778, P-value for maintaining communications = 0.206, P-value for meeting people = 0.212

Figure 5.24: Perceived impacts, by gender, culture & language domain
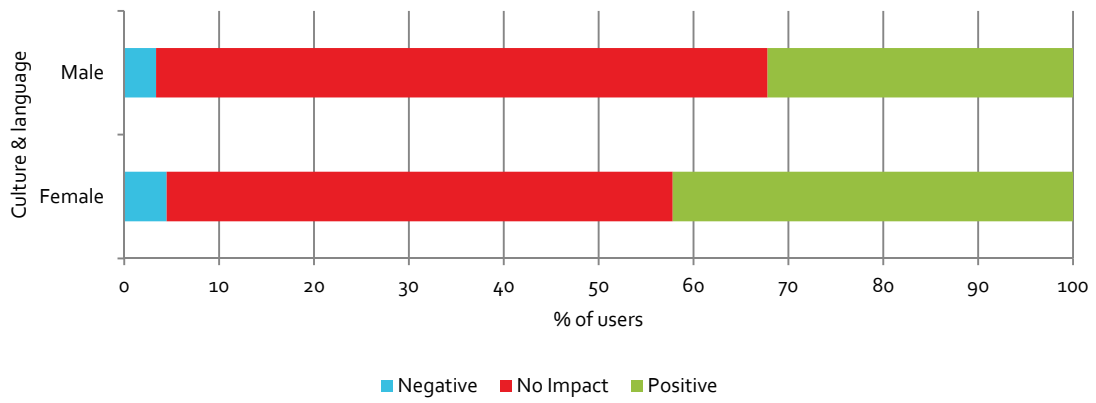
Note: P-value = 0

Figure 5.25: Perceived impacts, by gender, education domain
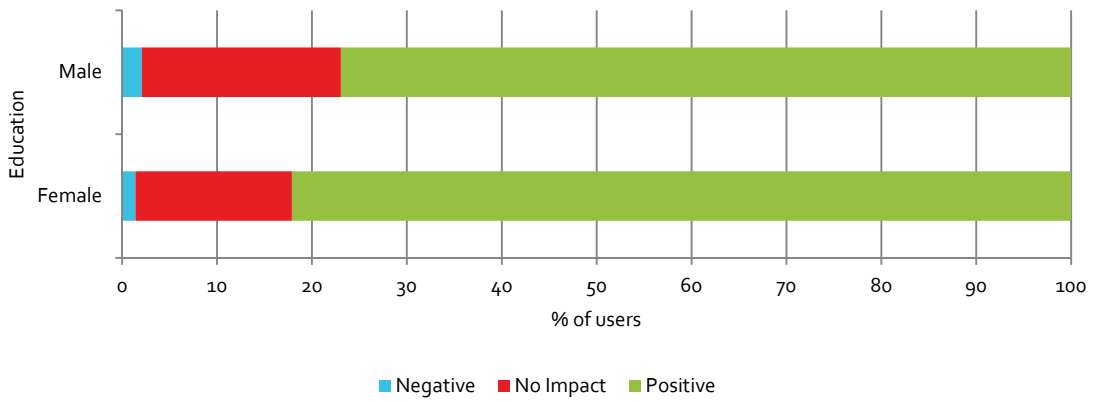
Note: P-value = 0.00008

Figure 5.26: Perceived impacts, by gender, employment & income domain
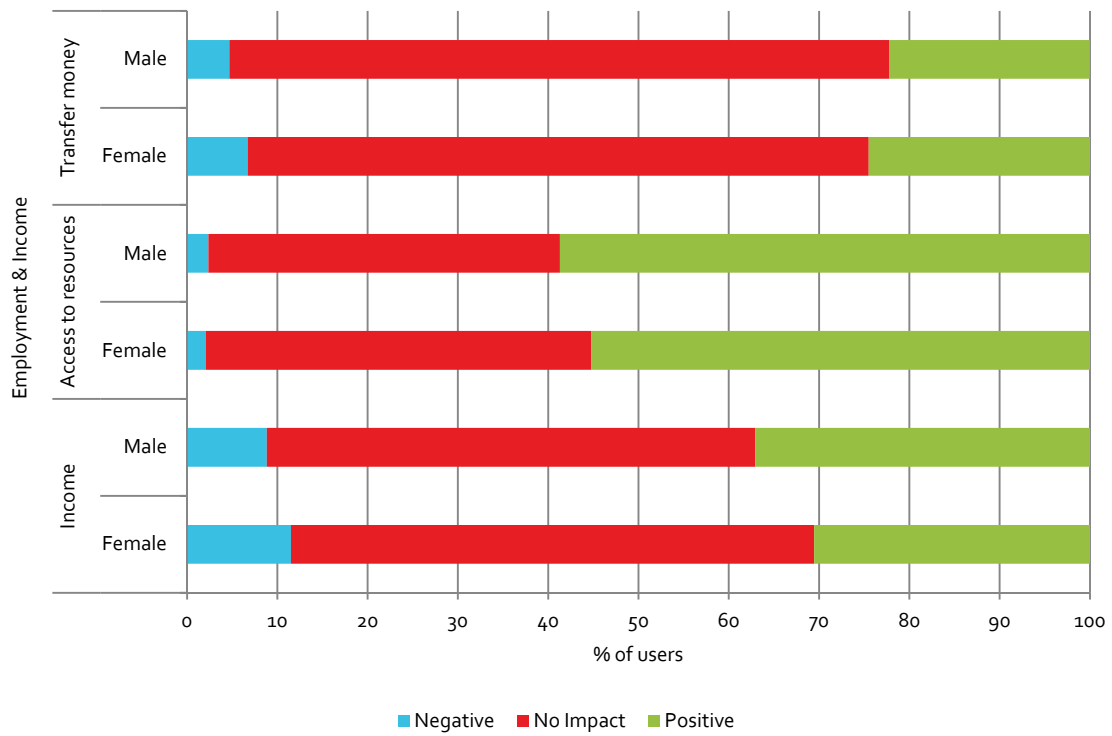
Note: P-value for transfer money = 0.023, P-value for access to resources = 0.003495, P-value for income = 0.0005

Figure 5.27: Perceived impacts, by gender, governance domain
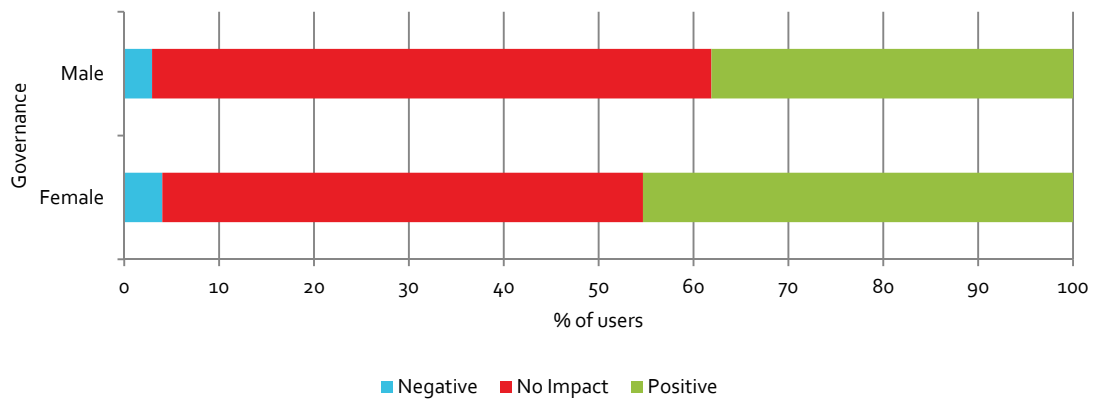
Note: P-value = 0.000013

Figure 5.28: Perceived impacts, by gender, health domain
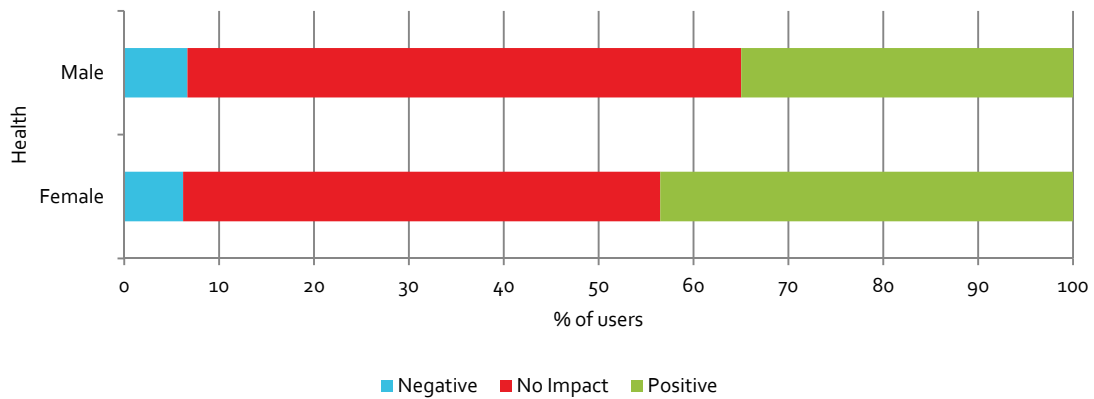
Note: P-value = 0

Figure 5.29: Perceived impacts, by gender, cross-cutting
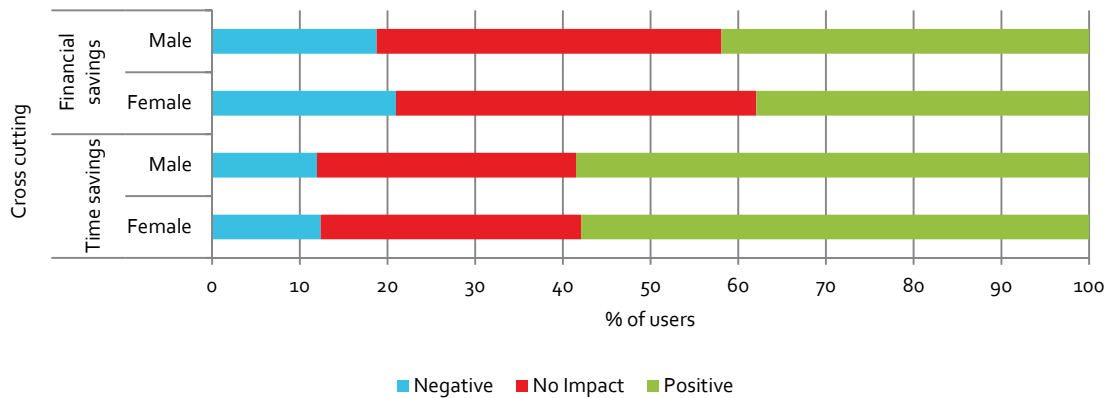
Note: P-value for financial savings = 0.0476, P-value for time savings = 0.384

For four of the impact categories, there was no significant difference between male and female users: *time savings*, *meeting people*, *maintaining communication with family & friends*, and *pursuing interests & hobbies*. For the other nine impact categories, the differences between male and female users were statistically significant (using a chi-square test); however, these differences were not all in the same direction.

▪ Male users were significantly more likely to report positive impacts in *income* and *access to employability resources*. They were also more likely to report positive impacts (and less likely to report negative impacts) in *financial savings*.

▪ Female users, on the other hand, tended to report positive impacts in *education, health, access to government information & services, culture*, and *pursuing leisure activities*. Higher proportions of women also reported positive impacts (and also negative impacts) in *sending & receiving remittances*.

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Overall, male users tended to perceive more positive impacts in the economic categories, while female users seemed to perceive more positive impacts in the social categories.

Even when the differences between male and female users were statistically significant, however, the actual observed differences still tended to be small in relation to the rather large sample size. Overall, female users are not uniformly disadvantaged in terms of using technology, to the extent that they perceive positive impacts in roughly similar proportion to male users. Of course, females do not visit public access venues in equal proportions — particularly in Bangladesh and Ghana — and barriers to participation clearly persist. Among the population of users, however, **female users benefit similarly to their male counterparts**. Further analysis would be needed to determine whether female users have characteristics that differentiate them from female non-users.

AGE

Young people comprised over 50% of users in every country (see Chapter 3). This analysis examined seven age groups, from ages 12–15 to over 65, revealing a number of trends in reported impacts.

Distinctions between age groups had statistical support: all impact categories except *culture* showed significant differences across age groups (using Chi-squared tests). In some categories, such as *health*, the difference between older and younger users was not great. (See Figures 5.18 to 5.25.)

- *Overall, younger users were more likely than older users to report positive impacts in categories related to social interaction and leisure (although many older users also saw positive benefits in these categories).*
- *Older users had a greater tendency to see positive impacts in the priority domains generally* (notably in *income*, *health*, *access to government information & services*, and *access to employability resources).*
- *Working-age users tended to see positive impacts in employment-related domains* (*income* and *access to employability resources*)*.*
- *Older adults tended to see positive benefits in the* health *and* government *categories.*
- *Younger users also reported positive benefits in some of the priority categories — particularly in* education*, where they had an equal or greater tendency to see positive impacts.*

Regarding *education* impacts, since younger users are typically in school it can be expected that they would report positive impacts. However, a high proportion of older users (50–65 and, especially, 65 and up) also reported positive *education* impacts, reflecting the availability of educational resources and activities through computer and internet access.

With regard to *communication with family and friends*, there were substantial impacts across age groups. Older users generally reported positive impacts more frequently in categories outside the social and leisure categories.

The 25–34 age group reported the highest percentages of positive impacts on *income*, as well as the highest percentages of positive impacts in *access to employability resources*. Users older than 50 reported the highest percentages of positive impacts on *health*.

Figure 5.30: Perceived impacts on hobbies & interests, by age
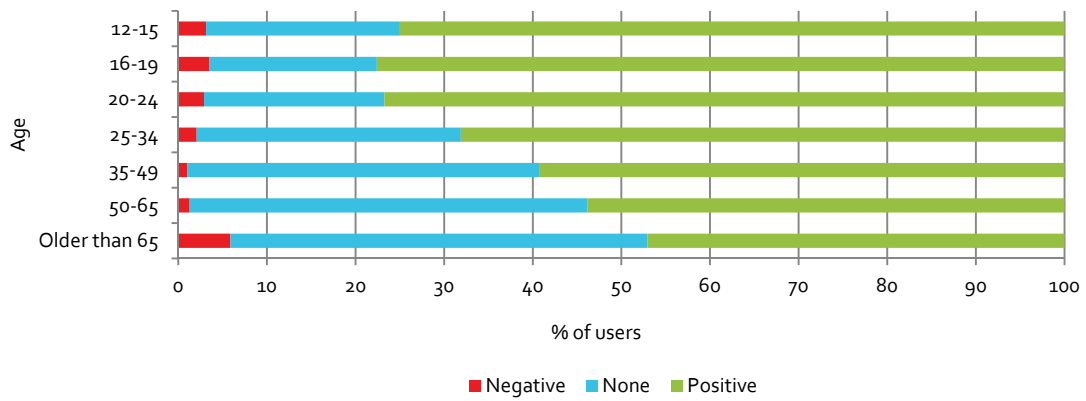
Note: P-value = 0.0005

Figure 5.31: Perceived impacts on meeting people, by age
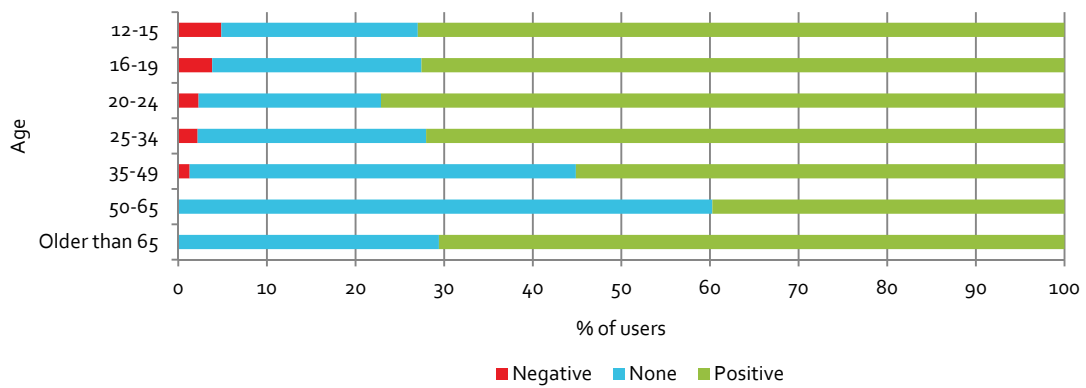
Note: P-value = 0.0005

Figure 5.32: Perceived impacts on education, by age

Note: P-value = 0.0005

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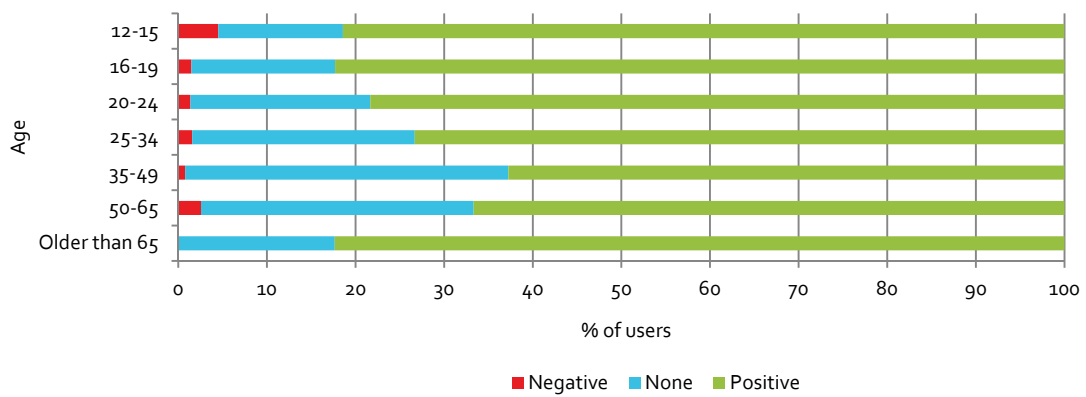
Figure 5.33: Perceived impacts on communications with family & friends, by age
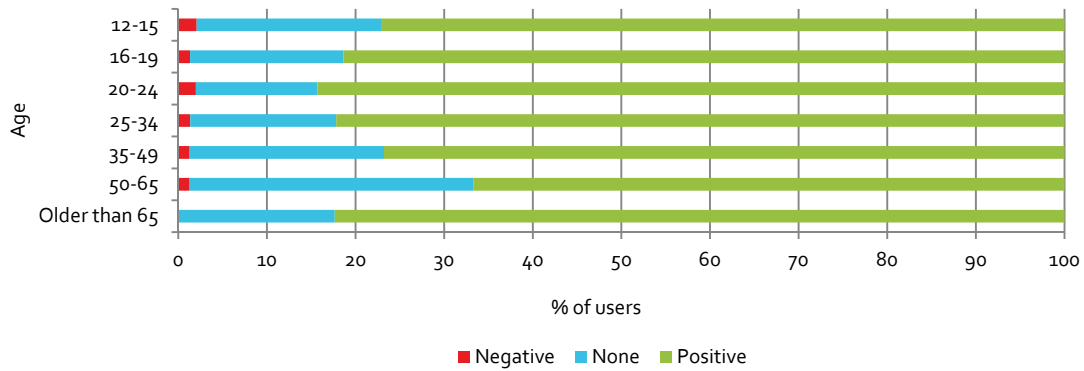
Note: P-value = 0.002999

Figure 5.34: Perceived impacts on income, by age
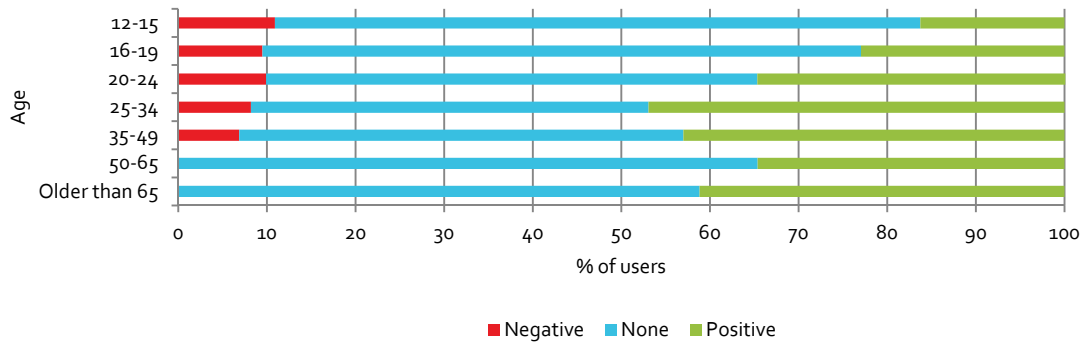
Note: P-value = 0.0005

Figure 5.35: Perceived impacts on access to employability resources, by age
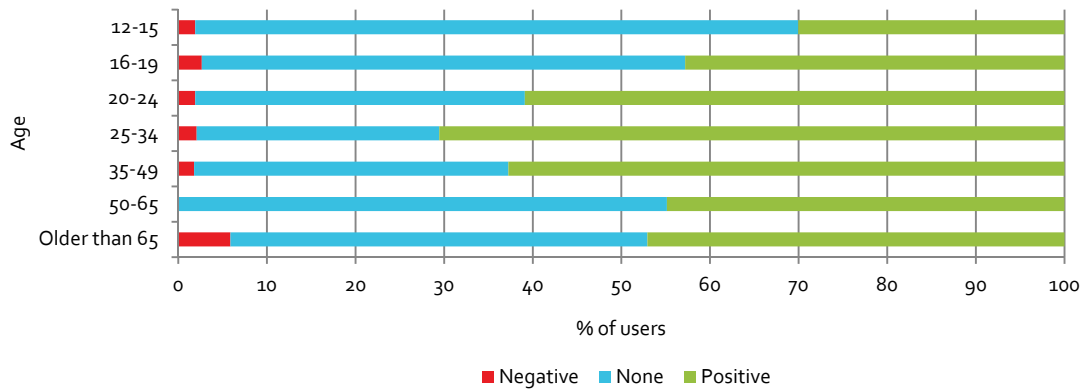
Note: P-value = 0.0005

Figure 5.36: Perceived impacts on health, by age

% of users

■ Negative ■ None ■ Positive
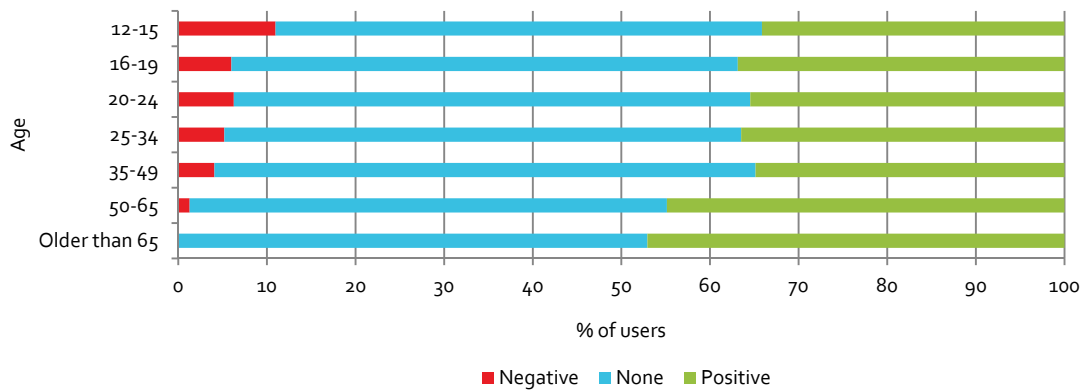
Note: P-value = 0.0005

Figure 5.37: Perceived impacts on government information & services, by age

% of users

■ Negative ■ None ■ Positive
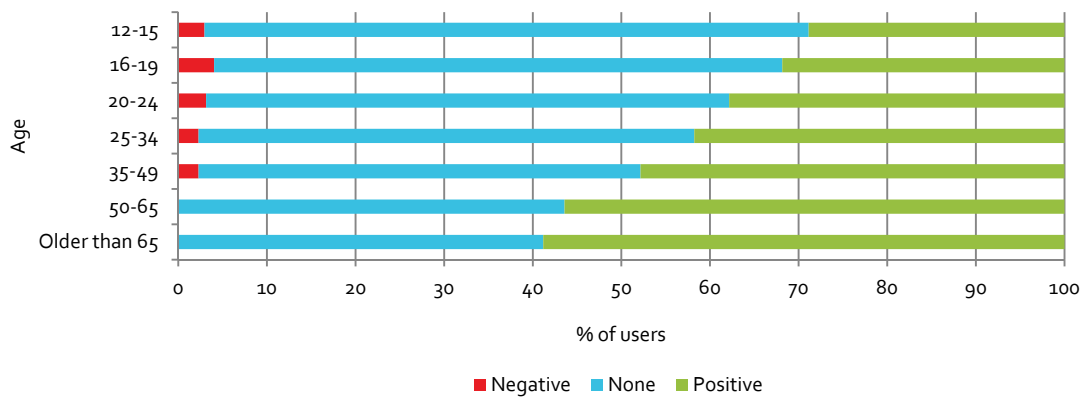
Note: P-value = 0.0005

RURAL USERS: A CASE STUDY OF BANGLADESH

Compared with urban users, rural users typically have fewer public access options, as commercial cybercafés are mostly concentrated in higher density areas. This lack of market provision is the most common public policy justification for investing in rural public access infrastructure.

This analysis of rural users focuses on Bangladesh. As discussed in Chapter 3, the definition of "rural" varies too widely between countries to allow for cross-country analysis. In Chile, for instance, there are no "rural" public access facilities because (by national definition) an area is considered urban if it has basic infrastructure such as electricity — so that every public access venue in Chile is by default in an urban area, since they use electricity to power the computers. The Bangladesh definition of rural, in contrast, is

based on an area's physical aspect, amenities, and population characteristics.[22] According to this definition, about 46% of the public access users in Bangladesh were classified as rural, yielding a significantly large population for study.

Since urban users tend to have greater social assets (education, income, etc.), it seems likely that they would make greater use of — and possibly derive greater benefits from — public ICT venues. Conversely, because of their deficits in these areas, rural users may have more to gain from public access ICTs and may therefore place higher value on their gains from public access use. This section begins with a look at usage, then shows the results of more in-depth analysis controlling for the variables of level of computer experience, seeking staff assistance, and venue type.

Figure 5.26 compares rural and urban users in Bangladesh in their use of public access venues in each of the six impact domains. Rural users trailed their urban counterparts in four out of the six domains, particularly in Communications & Leisure and Education, and secondarily in Employment and Culture & Language.

Figure 5.38: Domain usage, urban vs. rural (Bangladesh)
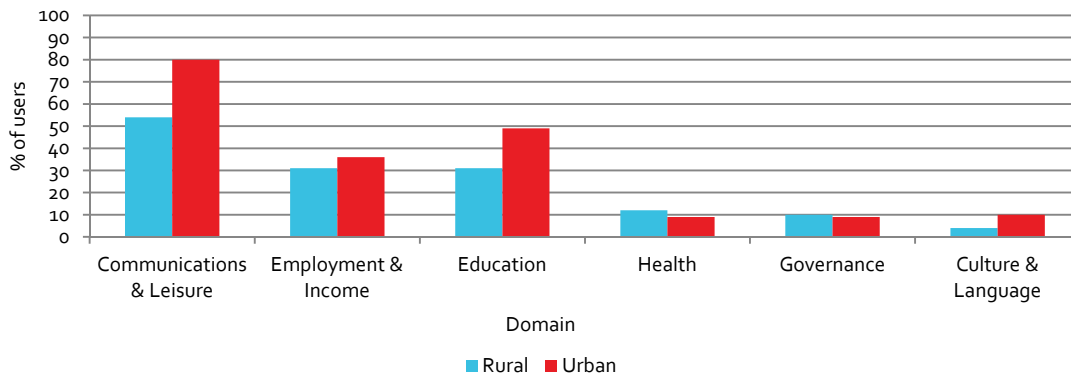
Another difference between these two groups is type of venue. Rural users largely visited telecenters, while urban users frequented cybercafés. Telecenter users tended to report lower usage, as well as lower levels of positive impacts, than cybercafé users in general.

To isolate the differences associated with urban and rural settings, the analysis controlled for three cross-cutting variables. The first was the users' level of computer experience. This possibility was addressed by comparing the percentages of rural and urban users reporting positive impacts at a given level of computer experience (say, six months). The results showed that ***within a given level of computer experience, there was little difference between rural and urban users in their rate of use and impact***

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[22] Urban and rural definitions for Bangladesh come from the Bangladesh Bureau of Statistics (BBS). The BBS defines an urban area as the developed area (i) around an identifiable central place, (ii) where amenities like metalized (paved) roads, communication facilities, electricity, gas, water supply, sewerage connections usually exist, and (iii) which is densely populated and a majority of the population involved in non-agricultural occupations.

reporting. That is, it seems likely that the level of computer experience contributes to the observed rural/urban differences. Rural users, who are more likely to be inexperienced telecenter users, offer fewer reports of positive impacts compared with more experienced urban cybercafé users.

Figures 5.27 through 5.31 show the perceived impact variables for rural and urban users in five specific impact categories, compared over levels of experience (determined by how long ago the respondent first used a computer). At each level (6 months or less, 7–11 months ago, etc.) the percentage of positive impacts reported by urban users and rural users is shown. In most cases, rural and urban users with the same level of computer experience generally showed a similar tendency to perceive positive impacts (with differences ranging from 1%-17%). This held for the priority categories of *income*, *access to government information & services*, *health*, and *local language & culture*. The only category showing a marked difference was *communications*, with higher proportions of urban users consistently reporting positive impacts as compared to rural users, regardless of computer experience level (differences ranged from 14%-34%).

Figure 5.39: Perceived positive impacts on income, by computer experience, Bangladesh
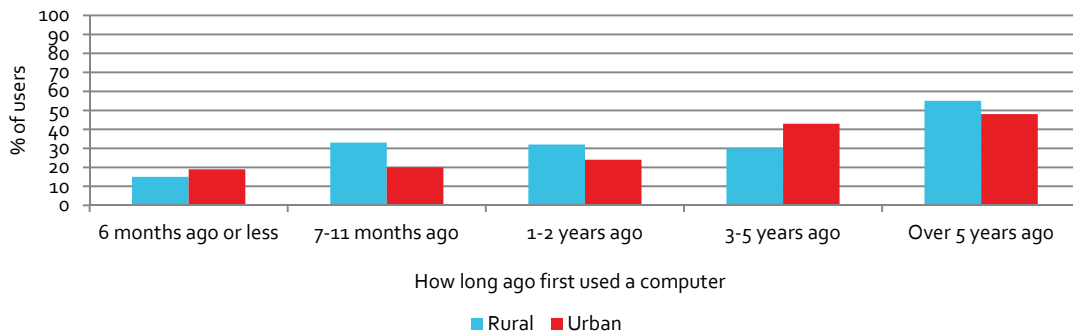
Figure 5.40: Perceived positive impacts on government, by computer experience, Bangladesh
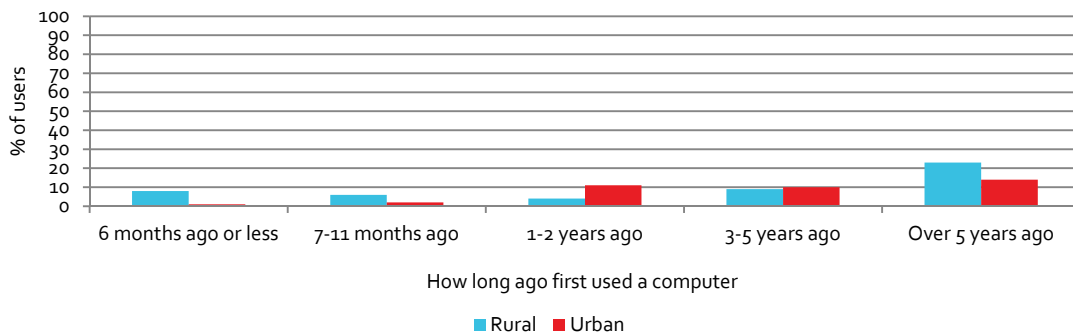
Figure 5.41: Perceived positive impacts on health, by computer experience, Bangladesh
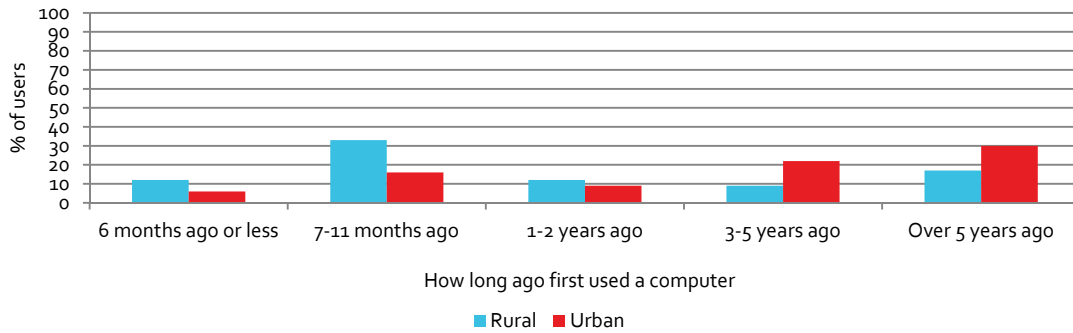
Figure 5.42: Perceived positive impacts on language & culture, by computer experience, Bangladesh
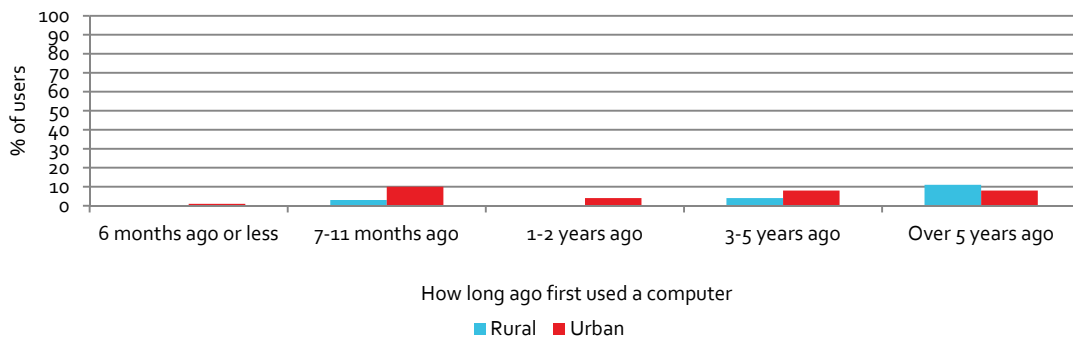
Figure 5.43: Perceived positive impacts on communication, by computer experience, Bangladesh
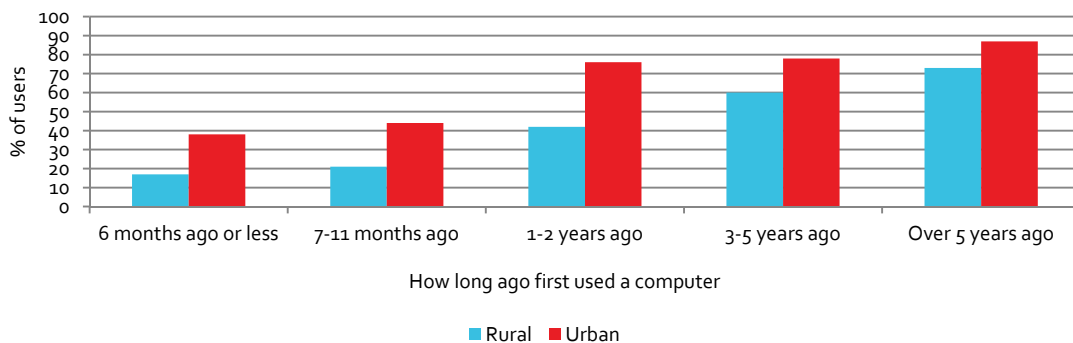
The second variable controlled for was usage frequency. In this analysis, rural and urban users with similar usage frequencies showed similar percentages of perceived positive impacts in most impact categories. Particularly in the categories of *income*, *education*, and *health*, urban and rural users had quite similar proportions of positive impact perceptions. For *access to government information &services*, *local*

language & cultural activities, and *communication with family & friends*, the results were more varied, possibly because of small sample sizes (after non-responses and logical skips).[23]

Comparing the third variable — venue type — the differences between urban and rural users' perceptions of impact were generally small in most impact categories. Interestingly, in *communication with family & friends,* rural telecenter users were much less likely to report positive impacts than either rural or urban cybercafé users, who had similar percentages of positive impacts. This could be because cybercafés are more open to their patrons' using social networking and other communication media.

The sixth domain: Communications & Leisure

Communication-related activities, including social networking, have an important place in any discussion of the value of public access venues. The data show that communicating with family and friends is the single activity with the greatest overall use, usage frequency, and perceived impact (see Table 5.2 and Figure 5.1 in Chapter 5). But are these activities as beneficial as other digital pursuits? What about leisure activities, such as gaming? Those questions frame this section.

In the conventional view, email and social networking, as well as *leisure activities* such as games and multimedia, are considered less productive activities than the five priority domains (Culture & Language, Education, Employment & Income, Governance, and Health). At the same time, there is growing recognition that Communications & Leisure is itself a worthy and legitimate domain. Two arguments support this view. First, communication activities are often a means to achieving outcomes in other areas, including in the five priority domains. And second, leisure digital activities may offer an "on ramp" for new users, developing important ICT skills that are transferable to other more instrumental uses.

Three specific questions were framed in order to investigate these broad claims.

1. How important are communications and leisure activities to acquiring ICT skills?
2. How strong is the association between frequency of communication and positive impacts in the priority impact categories?
3. How often were communications used to obtain information in health, education, etc.?

Two in-depth studies were also devoted to this topic. *Non-Instrumental Use: Skills Acquisition, Self-confidence, and Community-based Technology Teaching* explores the extent to which gaming and social networking enhance generic computer skills. *Interpersonal: The Impact of Cybercafés on the Connectedness of Children Left Behind by Overseas Filipino Workers* examines the impact of communications for families in which a parent works abroad.[24]

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[23] "Logical skips" are skipped questions that result when a respondent is dropped from a particular question because of a filtering process to decide who needs to answer certain questions.

[24] See Chapter 7 for an overview of these studies.

Communications and leisure activities for ICT skills building

Do communication and leisure activities contribute to building ICT skills? The self-reported survey responses were unambiguous. When asked whether use of public access computers for communication and leisure activities had improved their overall ICT skills, **94% of the users who used public access for communications and leisure activities in the last 12 months claimed it had improved their skills** (Figure 5.32).

Figure 5.44: Users who report communications and leisure activities improved their ICT skills

Has using public access computers for
communications and leisure improved your
overall ICT skills?

6%

94%

■ Yes ■ No
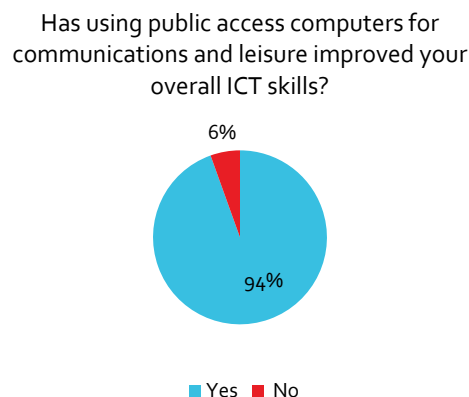
The in-depth study on non-instrumental computer use administered computer-based exercises to two groups: people who are largely non-instrumental ICT users ("players"); and people who are largely instrumental users ("workers"). The two groups performed equally well on a number of instrumental tasks. Moreover, additional non-instrumental use translated into greater instrumental skills. (Kolko et al., forthcoming.)

Frequency of use and impact

This section presents the percentages of reported positive impacts for several variables at four levels of communications frequency, in nine of the 13 impact categories. Seven of these nine impact categories are associated with the priority domains. The other two are the cross-cutting categories, *financial savings* and *time savings*. (The four communication and leisure categories are omitted: one would naturally expect to see a close association between frequency of communication and impact in the communication categories, such as *meeting new people*.)

The results, shown in Figure 5.33, are challenging to interpret. For most of the impact categories there was an increasing percentage of positive impacts with increased frequency of use for communication, for the first three frequency levels (i.e., through "most times you visit"). The main exceptions were the categories of *financial savings* impacts and *sending or receiving remittances*. However, there was a slight decrease in perceived positive impacts for the very highest frequency of communication use ("every time you visit"). It is possible that the most frequent communication users tend to be younger users or students, who would be less likely to report positive impacts in areas such as *income* and *employability resources*.

Figure 5.45: Percentage of perceived positive impacts, by frequency of using public ICT access for communication
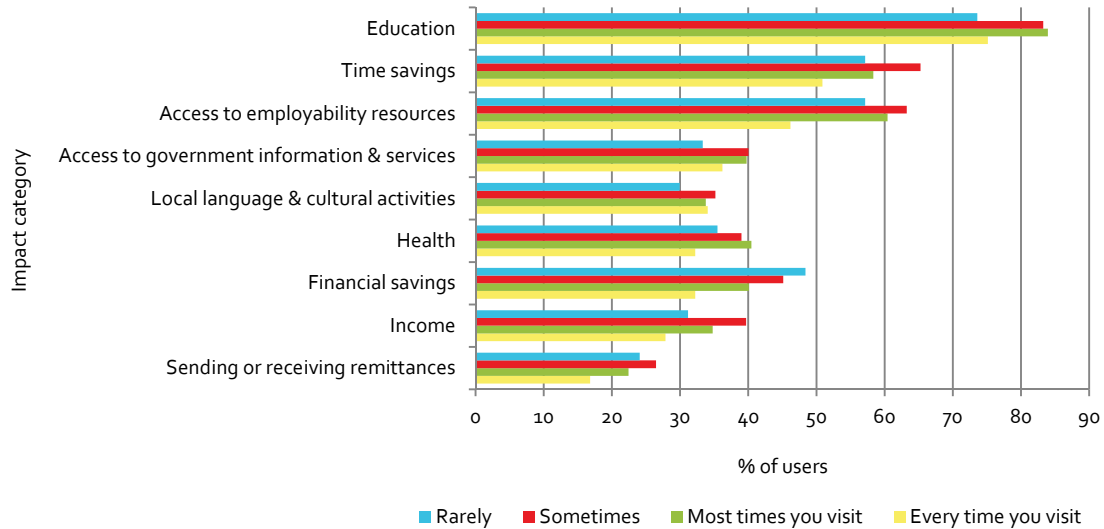
Communications as a path to achieving impact in priority domains

How important are communication activities for obtaining information in instrumental areas? Information objective achievement rates (the search, find, act progression) were explored earlier, finding that in general people were quite successful in tasks across all domains. For each task, respondents were asked what was the most important online source in being able to complete the task: website, friends (via email or social networking sources), family (via email or social networking sources), or other (open answer).

The findings paint an interesting picture. While websites were generally the most important resource for every task, a number of respondents reported that email and social networking were of paramount importance (Figure 5.34).

Figure 5.46: Users identifying email/social networking as most important resource to complete task
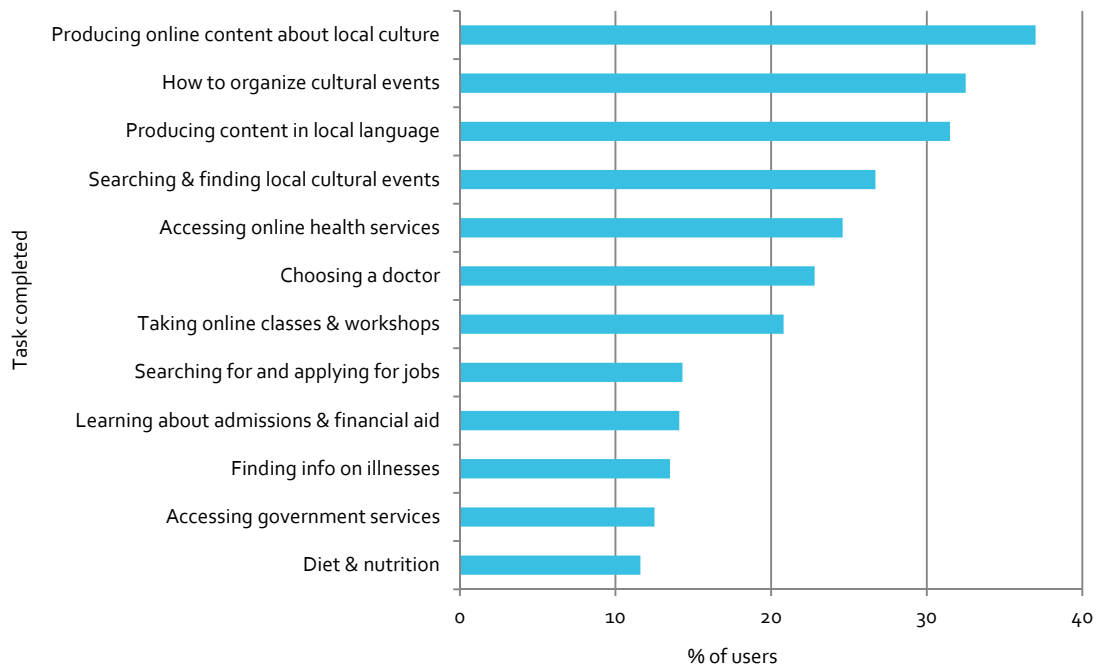
Of those tasks with large percentages of users identifying communications as most important, the top four tasks related to the domain of Culture & Language. The next two tasks, with nearly one in four such responses, were health-related: accessing online health services and choosing a doctor. This may reflect a tendency for people to seek the assistance of people they know for personal health issues. One in six respondents relied most heavily on email and social networking for searching for and applying for jobs.

These findings point to the major role that communication activities play in enabling task completion in virtually all of the priority domains. In fact, these figures understate the importance of communication tools, since respondents could select only one online resource as "most important." Communication activities such as email and networking undoubtedly have a place as one of the combination of tools — along with websites and offline sources — that help people navigate these tasks.

Summary

Public access ICT users perceive impacts in a number of areas of importance to their lives, in all five priority domains. Not everyone uses public access for every activity: lower usage was reported for the areas of Culture & Language, Governance, and Health. Among those users, however, high proportions considered the impacts positive. Moreover, beyond perceived impact, most users were not only able to find relevant information, but successfully took some sort of action based on that information (such as applying for a job). This was shown for a number of tasks across all domains.

With regard to venue type, although library and cybercafé users had generally similar usage patterns, library users reported positive impacts in higher proportions than cybercafé users. Moreover, library users were also more likely than cybercafé or telecenter users to report positive impacts in such priority

categories as *education*, *health*, *access to government information & services*, *local language & cultural activities*, and *time savings*.

Overall, there was little difference among various user populations in the rate of perceiving positive impacts. People of lower socioeconomic status, as well as females, older adults, and rural residents, in general perceived positive impacts in similar percentages to other groups. Similarly, unemployed users reported positive impacts almost as frequently as employed users, as did those below the poverty line compared to those above the poverty line. Education level, however, did make a difference in perceived impacts: the more educated users reported positive impacts more frequently than less educated users.

Although females in some areas are less likely to use public access facilities, the females who use them perceive positive impacts in proportions equal to males, with somewhat higher rates in the social categories and slightly lower rates in the economic categories. Older users, who constitute a minority of users (see Table 3.8), reported high levels of impact, particularly in the priority domains.

Rural users had lower overall usage rates in some domains than urban users. However, controlling for level of computer experience, usage frequency, and venue type, rural users mostly experienced positive impacts in similar proportions to urban users.

As a domain, Communications & Leisure showed the highest scores for usage and impact. This finding, already familiar from other research, is of concern to the extent that communications activities are considered not to contribute to developmental outcomes. There are reasons to question this view. First, nearly all users reported that communication and leisure activities improved their ICT skills. A test of skills of instrumental and non-instrumental users confirmed that non-instrumental ICT skills do indeed enable users to perform instrumental tasks. Second, a correlation, albeit weak, exists between communications usage and perceived impact. That is, the more frequently people communicated, the more likely they were to report positive impacts in other domains (with the exception of the most frequent communication users). Third, a substantial proportion of users reported that communications and social networking sites were the most important resource for achieving specific tasks, across a number of domains. These findings, along with those from the in-depth studies, suggest a prominent and positive role for communications and leisure within the development context.

6. Hidden Impacts: Non-users

The majority of studies on public access computing venues tend to overlook non-users. Including non-users, however, gives critical insight into the reasons that prevent people from making use of public access venues. In addition, some non-users may previously have used public access venues. Understanding past use can shed light on impacts from previous use, as well as reasons why people choose to stop going. Further, non-users can provide information on indirect impacts from their friends' and relatives' use of public access venues. Indeed, non-users may also value public access venues, either because of the indirect impacts they receive or the direct impacts others receive. This section provides a high-level discussion of the profile of non-users, impacts of past use, and the impacts of indirect use.[25]

Profile of non-users

Unlike public access users, who were sampled at public access venues, non-users were sampled at their homes. The sample was identified through a filtering process that sought to determine whether potential respondents had ever used a public access venue, and if so, how often, and how long ago. Non-users were classified into four groups:

1. **Ex-public access user/Computer user –** previously used public access venues, but has not in the past 12 months. Currently uses computers elsewhere.
2. **Ex-public access user/Computer non-user –** previously used public access venues, but has not in the past 12 months. Currently does not use computers.
3. **Never-public access user/Computer user[26] –** has never used a public access venue; currently uses computers.
4. **Never-public access user/Computer non-user –** has never used a public access venue and does not currently use computers.

For simplicity, these groups are referred to as ex-user/computer user, ex-user/computer non-user, never-user/computer user, and never-user/computer non-user.

The non-user sample was not stratified by these four categories. Out of the final sample of 2000 non-users, nearly 80% had never used a public access venue (never-users), and about 18% were ex-users. The

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[25] The analysis of non-users presented in this chapter focuses on public access non-users as a group, without breakdown by non-user type. However, the survey was designed to support such an analysis; more detailed analyses, such as comparing non-computer users to public access computer users, can be carried out in the future.

[26] Note that "never-users" also include respondents who have used a public access venue just once or twice. Such a small number of visits does not indicate a level of continued usage: using a public access venue once does not make someone a "user."

majority were not currently using computers anywhere else (computer non-users, 58%), while 40% were computer users. Table 6.1 shows the breakdown for the four types of non-user.

Table 6.1: Distribution of non-user types, by country (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Never-user, Computer non- User	55	63	42	35	81	52
Never-user, Computer User	26	29	31	36	11	24
Ex-user, Computer non-user	4	2	3	4	4	8
Ex-user, Computer user	15	6	24	25	4	16
Total	100	100	100	100	100	100

Notes: n=1,974. Totals for some countries do not add up to 100%, as it was determined after interviews that some respondents were actually users.

This breakdown of non-user types aligns with the observations in Chapter 3 about the link between user profiles and the national level of ICT connectivity. Countries with a lower level of connectivity and a shorter history of public access venue deployment, such as Bangladesh and Ghana, show larger differences dividing public access users from non-users (as well as from the general population). Those two countries also have a high number of never-user/computer non-users and a comparatively low number of ex-users, as shown in the demographic characteristics described in the following sections. It should be emphasized that the characteristics of the non-user sample are not a reflection of the national profile of non-users in any of the survey countries; they relate only to non-users residing in communities *in the vicinity of public access venues*.

Demographic characteristics

AGE

Non-users varied in age, but in general they were older than users (Table 6.2)***.*** Approximately 65% of non-users were 25 years of age or older, with more than 20% above 50 years. Non-users in Bangladesh were relatively younger than in other countries: nearly 50% were younger than 25 years, compared to 35% for all countries. In Ghana and the Philippines, about 30% of non-users were younger than 25 years. In Brazil, Chile, and the Philippines, around half the non-user population was 35 and older; in Bangladesh and Ghana that percentage was substantially lower.

Table 6.2: Non-users of public access venues, by age (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
12–15	8	10	6	6	5	14
16–19	12	20	9	11	10	8
20–24	14	19	13	12	19	11
25–34	22	23	24	15	29	17
35–49	23	18	21	29	23	22
>50	21	10	27	27	14	28
Total	100	100	100	100	100	100

Note: n=2,000

On average, non-users tended to be older than users (Figure 6.1). More than 65% of users but only 35% of non-users were below 25 years. Conversely, only slightly more than 10% of users but nearly 45% of non-users were over 35.

Figure 6.1: Users and non-users, by age group
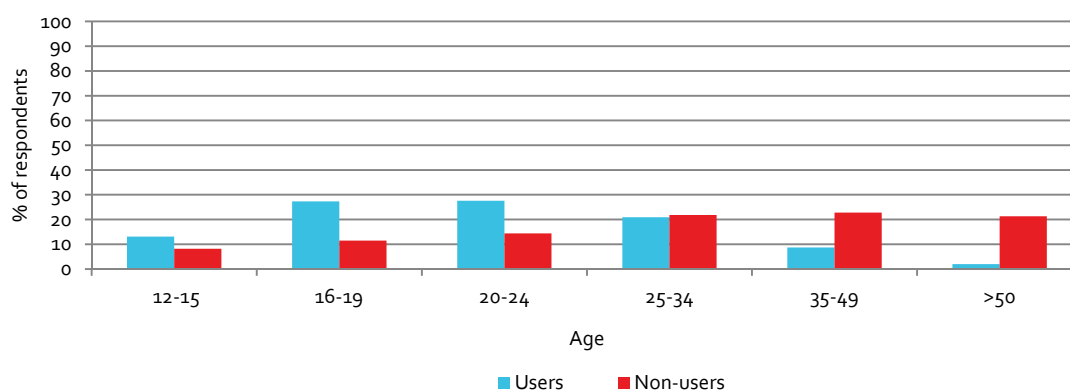
GENDER

The survey was designed to sample an equal proportion of male and female respondents: the gender ratio is roughly 50/50 and is not representative of the actual distribution of male and female non-users in the survey countries. For the respondent selection procedure, see the survey methodology report (Survey Working Group, 2012).

EDUCATION

Non-users tended to be less educated than users. Differences in education were most evident at the highest level (tertiary) and the lowest level (primary and below). More than 30% of users but only about 19% of non-users had completed some form of tertiary education (Table 6.3). Twenty-three percent of

non-users had only completed primary education, and 6% had only completed the pre-primary level; for users, these percentages were lower, at 16% and 2%, respectively (Figure 6.2). A lower level of education, combined with a relatively older population, helps explain why non-users generally had lower perceived computer skills than users (Figure 6.3). Notably, however, in the secondary and post-secondary education levels the percentages of users and non-users were similar.

Table 6.3: Highest level of education completed by non-users (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
College or higher	19	27	13	15	7	32
Vocational or trade school	15	16	26	18	7	10
Secondary school	37	39	29	43	31	44
Primary school	23	13	25	21	42	13
Pre-primary	6	5	7	3	13	1
Total	100	100	100	100	100	100

Note: n=1,956

Figure 6.2: Comparison of user and non-user levels of education

Highest level of education completed
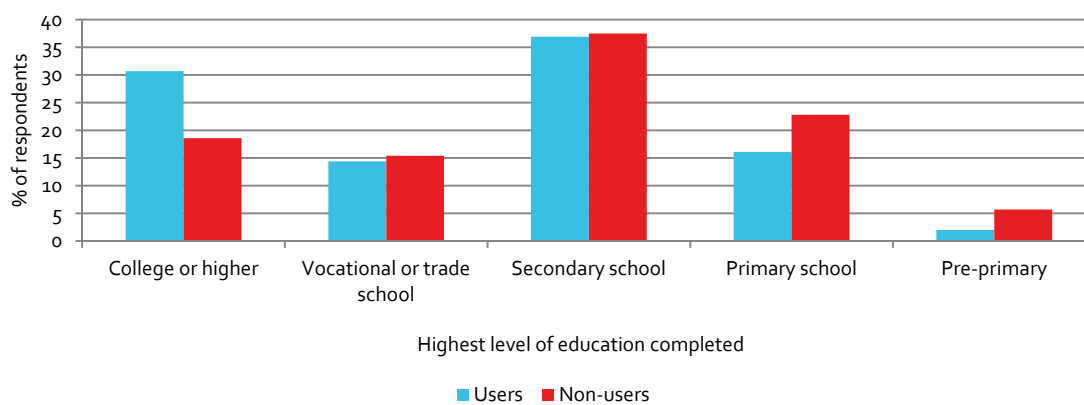
■ Users   ■ Non-users

Figure 6.3: Comparison of user and non-user self-reported skill levels in using computers
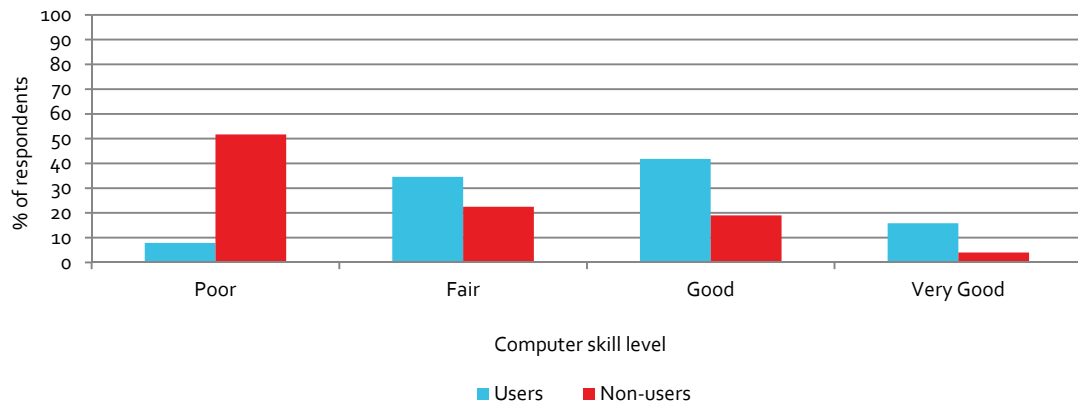
INDIVIDUAL INCOME

In general, there were more non-users above the poverty line than below.[27] There was wide variation between countries in self-reported income levels (Table 6.4). Whereas in Bangladesh only about half of non-users were above the poverty line, in Ghana a majority of non-users (60%) were above it. For Brazil and Chile, a large majority of non-users were above the poverty line (83% and 74%, respectively). In the Philippines, strikingly, only 20% of non-user respondents indicated incomes above the poverty line. (But see Figure 6.4: a similar percentage also held for the user group.)

Table 6.4: Non-users' self-reported personal monthly income (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Above Poverty	57	48	83	74	60	20
Below Poverty	43	52	17	26	40	80
Total	100	100	100	100	100	100

Note: n=1,574. The above data do not include students since generally students are not employed.

Comparing users and non-users, overall the group of users was more likely to indicate income below the poverty line, with substantial differences between countries (Figure 6.4). In Bangladesh and Chile, the percentage of non-users below the poverty line was higher than that of users. In the Philippines there was little difference between the two groups: in both cases, around 80% indicated income below the poverty line.

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[27] Note that this discussion is based on personal monthly income, as reported by respondents. Poverty lines are based on official classifications in each country.

Figure 6.4: Comparison of users and non-users in relation to the national poverty line
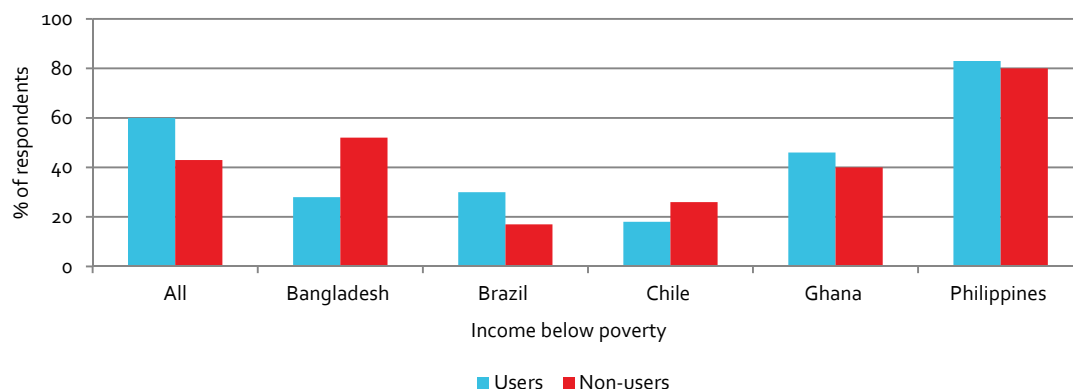
OCCUPATIONAL STATUS

Approximately half of non-users in the sample were employed, and approximately 22% were students. There was wide variation among countries: 45% of non-users in Ghana were self-employed, but only 7% in Brazil and 17% in Bangladesh and Chile (Table 6.5). The percentage of students ranged from 16% in Ghana to 35% in Bangladesh. The higher number of student non-users in Bangladesh correlates with a relatively young age of non-users (see Table 6.2).

Table 6.5: Occupational status of non-users (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Self-employed	22	17	7	17	45	23
Student	22	35	17	21	15	20
Employed full-time	20	14	29	20	16	22
Homemaker	14	28	11	19	2	9
Retired	7	2	13	12	3	5
Employed part- time	6	1	11	7	4	9
Unemployed, looking for a job	4	2	5	3	8	3
Unemployed, not looking for a job	3	1	2	.5	3	8
Other	2	0	5	.5	4	1
Total	100	100	100	100	100	100

Note: n=1,964

Figure 6.5 compares the employment status of non-users to that of users. The pattern corresponds to age data: the higher proportion of young users translates into a much higher proportion of students among users (44%) than non-users (22%). The non-users who were relatively older had a much higher proportion of retired individuals and homemakers than users.

Figure 6.5: Comparison of users and non-users by employment status
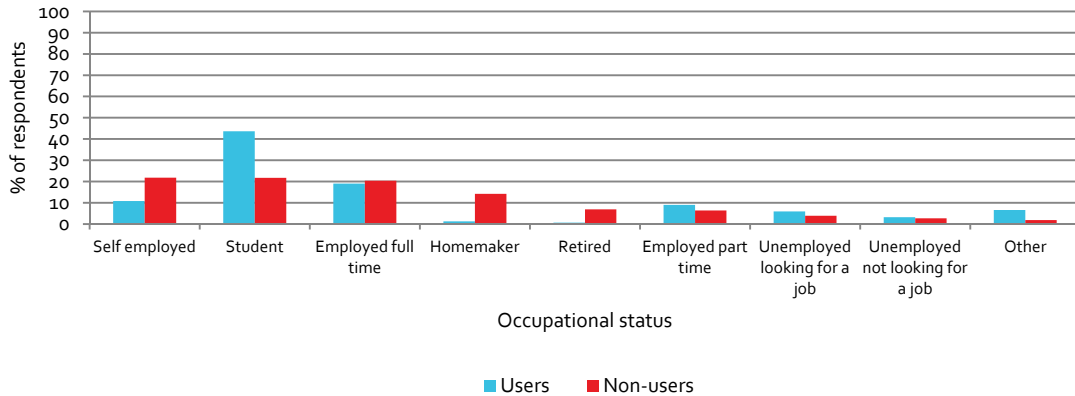
AVAILABILITY OF TECHNOLOGY IN THE HOME

Non-users had mixed access to other forms of information and communication technologies. Forty-seven percent of individuals indicated that they had a computer at home, with 32% indicating they had a computer with internet access (Table 6.6). These figures vary by country. In Chile, 70% of non-users indicated they had a computer at home, compared to only 26% in Ghana. Overall, non-user levels were generally similar to users for all technologies (Figure 6.6).

Table 6.6: Technology availability in non-user households (%)

Technology	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Computer	47	35	58	70	26	46
Computer w/internet connection	32	19	52	50	6	34
TV	96	95	99	99	91	97
Radio	77	32	91	98	89	75
Mobile Phone	94	98	90	93	95	94

Note: n=2,000

Figure 6.6: Comparison of user and non-user technology in the home
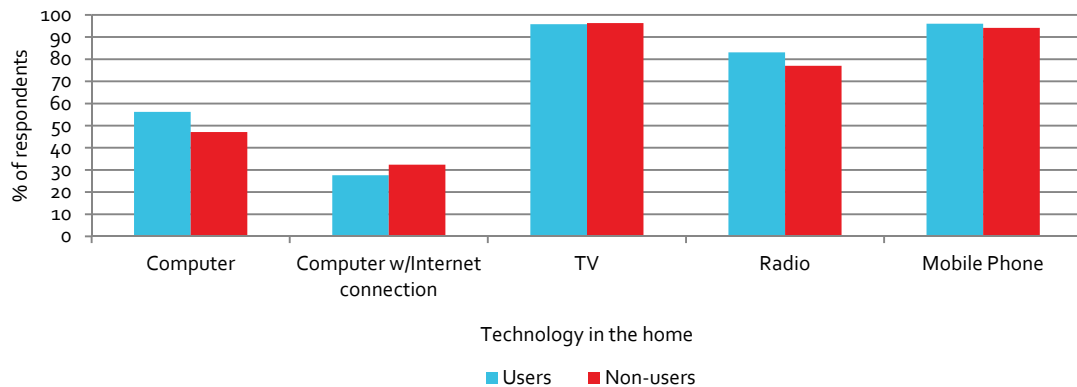
Reasons for non-use

Non-users were asked to name the two main reasons they do not use a public access venue. The most common reasons were that they *did not know how to use computers* or they *had computer access elsewhere* (Table 6.7). Only small proportions cited *inconvenience*, *no venues in area*, or *access to mobile internet* as reasons for not using public access venues.

Table 6.7: Reason for not using public access (%)

	Percent
I do not know how to use computers	65
No need, I have a computer at home/work	53
No need, I have nothing to do on computers	52
I do not have time to visit public access venues	39
Do not feel comfortable using computers in public	13
Services are not affordable	11
Venues are not conveniently located	5
Hours of operation are not convenient	5
No need, use internet on a mobile phone	4
No venues in the area	2

Note: n=1,926

Since non-users were asked for their top two reasons, it is worth examining how the two reasons congregate. The three most common *pairs* of reasons were:

1. "I do not know how" paired with "I have no need because I have nothing to do on computers" (25%). The group of non-users giving these responses are computer/internet non-users, as well as non-users of public access.
2. "I do not have the time to visit public access venues" and "I have no need because I have a computer at home or work" (16%). This group represents computer/internet users who do not use public access.
3. "I do not have the time to visit public access venues" and "I do not know how to use computers" (9%). This group is similar to Group 1. Together they constitute a third of non-users (34%).

Group 1 and Group 3 do not use public access venues because they simply do not use that kind of technology. Group 2 does not use public access because they have access either at home or at work, eliminating their need for a public access venue.

Other questions give additional insight into these three classes of non-users. In answer to the question, "Do you currently use a computer?" 409 out of 410 in Group 1 answered "No," as did all 144 of Group 3, while all 257 in Group 2 said "Yes." Group 3, while similar to Group 1, indicated more interest in using computers and therefore may access a public access venue in the future: 32% of this group expected to start using computers soon, compared to 15% of Group 1.

It can be concluded that people's non-use of public access is rooted more in their personal situation (e.g., already have access, do not have the skills) than in negative attitudes toward public access venues. Also worth highlighting is the *limited relevance of mobile phones as a factor contributing to non-use of public access computers*.

Impacts of past use on digital inclusion

The data show that for one subset of non-users — former public access users (18% of non-users) — public access venues have in many cases been a critical resource in the past, providing access to information technology and information resources and contributing to their development of ICT skills. This section discusses the digital inclusion impacts on this group of non-users.[28]

Technology access

Overall, most non-users first used computers and the internet either at home or at school (over 50% for the two venues combined). The group of former users, however, were more likely to have first used computers at a public access venue than at home (Table 6.8). They were also more likely to have first used the internet at a public access venue, than either at home or at school (Table 6.9).

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[28] Ex-public access users were not asked about the *socioeconomic* impacts of their own past use, which are not discussed here. Indirect impacts from proxy use are discussed below, in the section on social and economic impacts.

Table 6.8: Venue of first use of computers: non-users (%)

	Ex-users	Never-users	All
School	30	23	25
Public access venue	28	-	11
Home (personal or family computer)	17	41	32
Friend/neighbor/relative's house	13	15	14
Work	8	18	14
Some other place	4	5	4
Total	100	100	100

Note: n=1,047

Table 6.9: Venue of first use of the internet: non-users (%)

	Ex-users	Never-users	All
Public access venue	35	-	14
School	29	19	22
Home (personal or family computer)	13	47	34
Friend/neighbor/relative's house	12	13	13
Work	7	15	12
Some other place	4	6	5
Total	100	100	100

Note: n=842

Public access venues were most often mentioned by those former users who were no longer using computers (ex-user/computer non-users): 47% of this group first used computers and 46% first used the internet at public access venues. For ex-users who were still using computers, the percentages were slightly lower: 32% for first use of the internet, and 24% for first use of a computer.

Information access

Out of 372 ex-users surveyed, 109 (29%) indicated that they had used a public access venue for information searches, mainly related to education (38%) and employmen*t* (20%) (Table 6.10). This compares to the pattern among users (see Chapter 4): 47% had come to the venue to look for information, with education, entertainment, and employment information topping the list.

Table 6.10: Types of information searched for at a public access venue: ex-users (%)

Type of information	Percent
Education	38
Job/employment	20
News	6
Health	4
Cultural	3
Government services	1
Other	5

Note: n=109

Development of ICT skills

For non-users overall, non-public access venues — such as the home, school, and workplace — were the primary locations for developing computer and internet skills (Table 6.11). However, former public access users, particularly ex-user/computer non-users, considered public access venues to have been more important than other locations for development of their computer (40%) and internet (42%) skills. This stands in contrast to ex-user/computer users: only 9% considered public access to have played the most important role in computer skill development, and none identified it as relevant for developing their internet skills.

Table 6.11: Most important venue for development of computer and internet skills (%)

	All Non-users		Ex-user/Computer non-users	
	Computer skills	Internet skills	Computer skills	Internet skills
	n=1,039	n=794	n=83	n=60
Home	50	53	8	9
School	18	15	23	20
Work	14	14	13	14
Friend's house	9	11	13	9
Public access venue	6	4	40	42
Other place	3	3	3	6
Total	100	100	100	100

Impacts of indirect use

Digital inclusion

Some digital inclusion benefits of technology and information access were evident for non-users through indirect access. The study did not explore indirect impacts on development of ICT skills.

TECHNOLOGY ACCESS THROUGH PROXIES

Between 10% and 23% of public access venue users reported having used a venue on another person's behalf. (The range reflects variation according to the domain of activity — Education, Governance, Health, etc.) This discussion refers to these users as "proxies"). Even though, in some cases, proxies may have been acting on behalf of other users rather than non-users, ***this finding points to the potential reach of public access facilities beyond those having direct physical access***.

Similarly, approximately 10% (192) of non-users in the survey had asked someone to use a public access venue on their behalf — i.e., act as a proxy — during the last 12 months. The need for internet access appeared to be the motivating factor: non-users who did not have internet access at home were more likely to have asked someone else to serve as a proxy (Table 6.12). Whether a non-user was a computer user, or had access to a computer, had no effect on this percentage.

Table 6.12: Relationship between household internet connection and indirect public access use (%)

Use of Proxy	Household internet connection	
	No	Yes
No	88	93
Yes	12	7
Total	*100*	*100*

Note: n=1,882.Chi-squared = 7.733; df = 2; P-value = 0.02093.

Non-users had a range of reasons for asking another person to use a venue on their behalf, including: emailing family and friends; sending documents; word processing; and searches for information (Table 6.13).

Table 6.13: Types of tasks requested via proxy at a public access venue (%)

Task	Percent
Email family/friends	24
Submit document	14
Word processing and related	22
Information search	55
Other activities	14

Note: n=192

INFORMATION ACCESS THROUGH PROXIES

Non-users benefited from information availability at public access venues: of the 10% who had accessed a venue through a proxy, 55% had asked for help with an information search, mainly education or employment related (Table 6.14).

Table 6.14: Types of information searches requested via proxy at a public access venue (%)

Type of Information	Percent
Education-related	34
Job/Employment-related	14
Health-related	8
Government services	6
Culture-related	3
News	2

Note: n=192

Social and economic impacts

Of those non-users who had family and friends who used public access, 68% reported positive impacts in one or more of the 13 impact categories. The trends were somewhat similar to the impacts perceived by users: the highest percentage of positive impacts were in the categories of *maintaining communication with family & friends* (63%), *education* (51%), and *meeting new people* (45%); the lowest percentages were in *financial savings* (27%) and *income* (23%). (See Table 6.15.) This section examines those results in detail.

Table 6.15: Non-user perceptions of positive public access impacts (%)

Impact Category	Positive Impact
Maintaining communication with family & friends	63
Education	51
Meeting new people	45
Pursuing other leisure activities	40
Pursuing interests & hobbies	40
Time savings	39
Health	39
Access to employability resources	35
Access to government information & services	32
Local language & cultural activities	29
Sending or receiving remittances	28
Financial savings	27
Income	23

Note: n=976

NON-USER SUB-GROUPS

Non-users are by no means a homogeneous group. The study compared sub-groupings of the non-user population on two variables. 1) Those who had some access to computers were compared with those who had no access (i.e., computer users vs. computer non-users). 2) Those who had used proxies to perform tasks at public access venues were compared with those who had not (i.e., proxy users vs. proxy non-users).

Computer users versus computer non-users
About 40% of the non-user sample had alternative access to computers, either at home or at work. It would be reasonable to expect that fewer computer users would perceive positive (indirect) impacts from public access venues, since they have alternative access to computers. However, the reverse was true: ***Computer users were more likely than computer non-users to perceive positive indirect impacts.*** Relative to non-users overall, greater percentages of computer users reported positive indirect impacts of public access in every category of impact (Figure 6.7). The categories that showed the greatest variation between Computer users and Computer non-users were: *pursuing leisure activities*, *pursuing other interests & hobbies*, *maintaining communication with family & friends*, and *education*.

It is not clear why having other means of accessing computers would increase perceptions of positive indirect impacts from public access venues. Possibly, a greater familiarity with technology makes computer users more likely to recognize the potential benefits of access to ICTs. Additionally, they may

appreciate the fact that their family and friends have use of public access venues, making it easier for them to communicate with those individuals and thus creating indirect impacts in areas like *pursuing leisure activities* and *communication with family & friends*. In other words, non-users might appreciate public access venues because they facilitate their connectivity with others who do not have alternative options for computer or internet use.

Figure 6.7: Impacts of public access venues on non-users, grouped by computer use
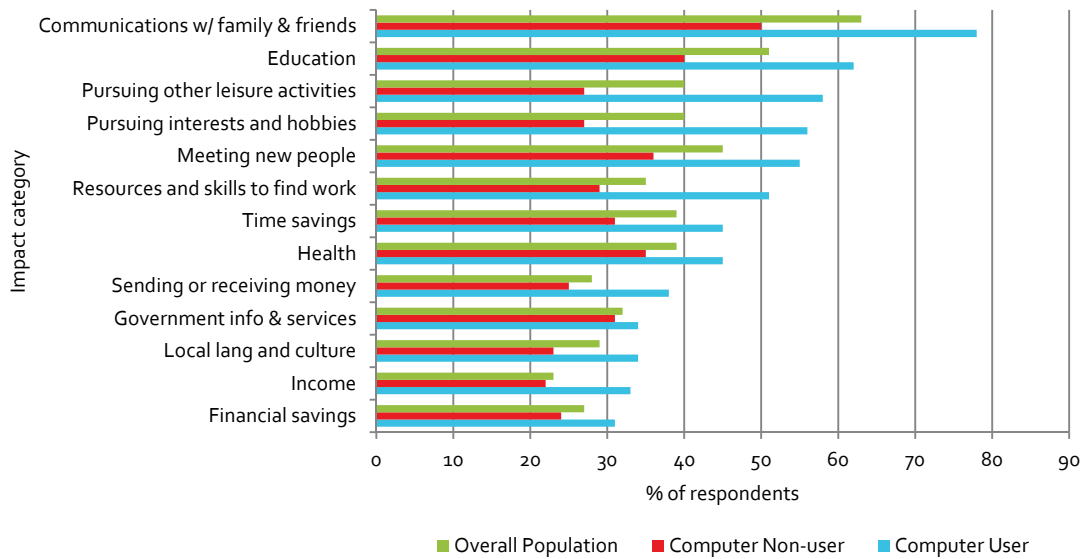
Using a proxy versus not using a proxy
A proxy user is anyone who has friends or family members use a public access venue on their behalf. Ten percent of the non-user sample were in this category. When compared to those who did not use proxies, *a greater proportion of proxy users reported positive indirect impacts,* in all impact categories (Figure 6.8). The greatest difference was in the category *education* (19% difference), and the least difference was in *access to government information & services* and *employability resources* (8% difference). This finding suggests that the more deliberate the attempt to access a service at a public access venue, the more likely it is to show perceived impacts.

Figure 6.8: Impacts of public access venues perceived by non-users, grouped by proxy use
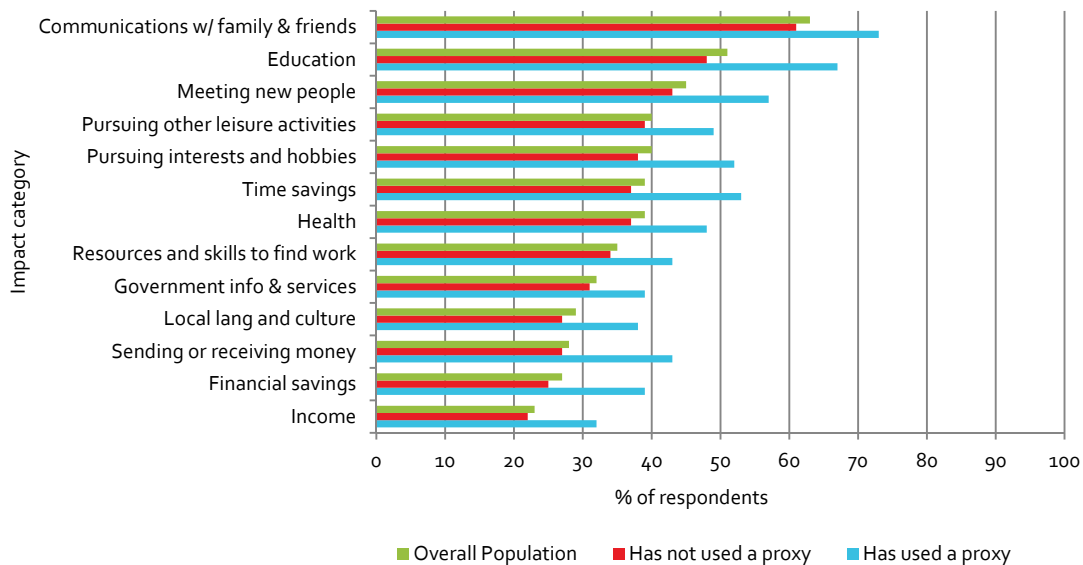
COMPARING TYPES OF IMPACT

To get a better idea of the relative importance of indirect impacts, the study compared three measures of positive perceived impact, derived from the user and non-user surveys:

1. *Direct impacts of public access* as reported by users of public access venues (from the user survey).

2. *Indirect impact of public access* as reported by non-users (from the non-user survey).

3. *Direct impact of non-public access* to sources of information and communication (e.g., home or office computer, radio, newspapers, or professional contacts), as stated by non-users (from the non-user survey).

In various combinations, these three types of impacts offer different perspectives on the indirect impacts of public access. These perspectives were explored as possible explanations for the pattern of responses from non-users:

- The direct impacts and indirect impacts of public access both relate to public access resources, but from the perspective of different populations (users and non-users).
- The impacts of non-public access information sources and the indirect impact of public access venues both relate to the non-user population, but show the impacts of different resources (public access and non-public access).
- The impacts of public access venues on users and of non-public access information sources on non-users both represent direct impacts.

The study examined all three types of impacts across the 13 categories of impact, in order to determine which factor or factors may have the most influence on a particular category.

Technology & Social Change Group

Of the three types of impact, by far the most frequently reported positive impacts were direct impacts reported by the actual users of public access venues (impact type 1). (See Figure 6.9.) In a few areas (*health*, *local language and culture,* and *resources for employment*), the dominant impact was from non-users' direct access to non-public sources (impact type 3). For *sending and receiving money,* the dominant result was direct impact of public access on non-users (impact type 2), closely followed by impact type 3. Overall, impact type 3, the direct impacts of non-public access information sources on non-users, was second in preponderance, and impact type 2, indirect impacts of public access on non-users, showed the lowest incidence.

Figure 6.9: Rate of positive impacts, by type of impact and information source
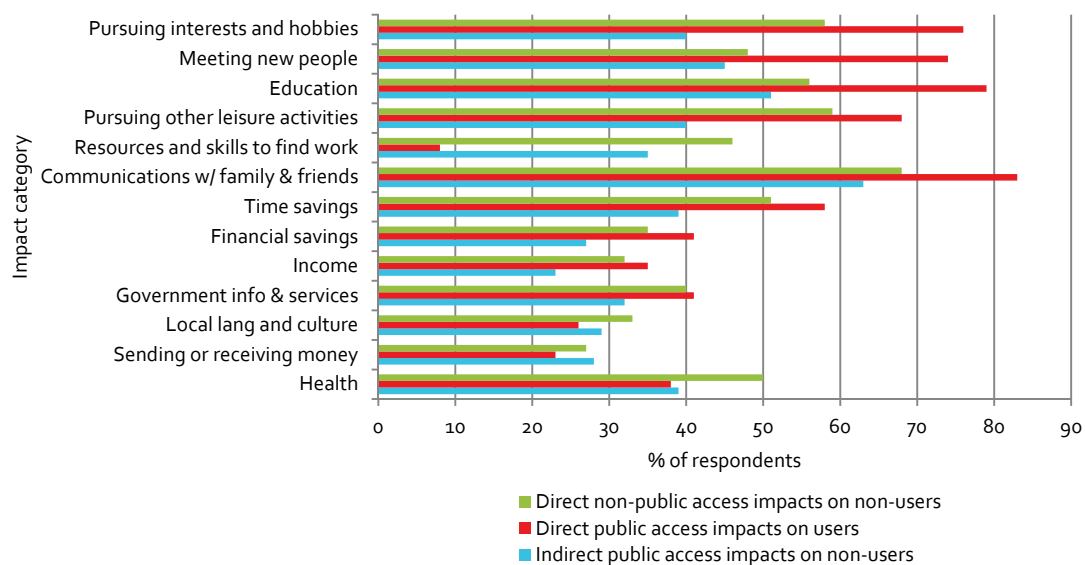
In summary, *direct access* to whatever kind of information and communication resources seems more likely to elicit positive impact perceptions than *indirect access*. But while direct access may be more impactful, the frequency of responses citing indirect impacts of public access was impressive, ranging from 27% of (non-user) respondents to 68% (Figure 6.9). **The resources provided by libraries, telecenters, and cybercafés clearly have a substantial reach, even beyond their physical facilities**. This hidden impact should be factored into assessments of the returns on public access investments.

The *health* category stood alone as a case in which the positive impacts of public access appear virtually identical for users and non-users (38% and 39% respectively), while the level for non-public access information sources was much higher (50%). This could be a reflection of a lack of adequate online health resources, as well as people's preference for more private contexts for dealing with health-related interests and concerns.

Summary

There is no question that public access has impacts that reach beyond those who are directly using public access venues at any point in time. Former users consistently rated public access as having played an important role in their introduction to and development of skills in computer and internet use. A subset of public access non-users indirectly made use of public access, by asking a user to perform some activity

on their behalf (proxy usage). More than one-third of non-users reported positive impacts in their lives from their friends and family having public ICT access, depending on factors such as proxy usage and whether respondents have alternative access to computers.

Further research is needed to fully understand the dynamics of public access impacts on non-users. A three-way comparison of reported impacts — the indirect impacts of public access venues on non-users, the direct impacts of public access venues on users, and the direct impacts of other information sources on non-users — can be further analyzed in terms of factors such as population, type of impact, and information source. Overall, it is clear that *direct* access to information and communication resources (whether through public access venues or some other avenue) is more likely to have positive impacts than indirect access. Nevertheless, the reports of indirect impacts of public access were quite substantial and constitute an important element of the impacts that public access venues deliver. Together with the significant influence of past use on many non-users, this hidden aspect should be incorporated into assessments of public access impacts.

7. Looking Closer: Salient & Contested Issues[29]

Five in-depth case studies focus on specific aspects of public access, examining issues that tend to generate controversy about the usefulness and impact of public access. What is the importance of "infomediaries" — skilled venue staff who can intermediate between users and information resources? Does it make a difference for public access users to be in the company of others? What is the value of public access venues if they are largely used for gaming, social networking, or interpersonal communication? Is there a continued role for public access when a growing majority of the people they were designed to reach have access to mobile phones?

The purpose of these studies is to provide evidence-based findings that can help institutions and policymakers create informed and useful guidelines for public access venues, whether in libraries, schools, or other public facilities. The findings also suggest potentially fruitful avenues for public access technology design. Each of the five studies is summarized here, as well as presented in detail in separate reports (see Appendix 3).

Study overviews

By focusing on specific features of public access venues and their use, these five in-depth studies provide an important complement to the national surveys. They explore the specifics of usage patterns and, in some instances, measure observed practices: sharing behaviors; the character of infomediation the impact of "non-serious" uses; the impact of public and private computer-mediated communications; and the extent of mobile internet substitution for public ICT access. Each study focuses on particular research populations, such as Ghanaian cybercafé users, Brazilian LAN-house patrons, Filipino children of overseas workers, or South African youth.

Sharing: Understanding and Rethinking Shared Access

Because public access venues bring many users together in one place, they make it possible to share computers and use them collaboratively, in contrast with individual use of private ICT resources. The Sharing study surveyed 150 users in two Accra (Ghana) cybercafés, one urban and the other rural, to analyze collaborative co-present sharing in cybercafés and the impact associated with sharing. It found that public access enables a range of sharing and collaboration among patrons, from the most simplistic (such as asking a café employee a quick question) to more formalized (such as meeting business partners to work together around a single computer) to fleeting and voyeuristic (such as noticing an interesting

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[29] This chapter draws extensively from the final reports of five Global Impact Study in-depth studies, listed in Appendix 3, without including specific citations. Full citations and bibliographies can be found in each of the study reports.

website on a nearby computer screen). Participants highlighted the learning benefits of working together, rather than the cost savings of shared ICT access.

Infomediaries: Brokers of Public Access

Staff who serve as intermediaries between users and ICT resources represent an important feature of public access venues. To understand how these infomediaries affect the outcomes for public access venues users, this study compared Bangladesh, Chile, and Lithuania using a combination of infomediary interviews, user focus group discussions, library manager interviews, field visits, and ethnographic studies. The study found that the ability of infomediaries to empathize with public access venue users is as important as their technical skills. Infomediary assistance gave novice patrons confidence to learn about ICTs, providing an important path to social inclusion. Empathy involves a range of attitudes and behaviors, such as the capacity to understand the (often unexpressed) needs of variously skilled users, and to show flexibility and initiative in meeting those needs. The study found, however, that while technical skills are directly cultivated and valued, empathy is seldom explicitly codified or rewarded by public access venues. It also found that non-profit and for-profit venues did not differ much in how they encouraged staff empathy.

Non-Instrumental Use: Skills Acquisition, Self-Confidence, and Community-based Technology Teaching

Non-instrumental activities, such as gaming and social networking, draw many users to public access venues. This study examined whether these activities contribute to users' acquisition of the computer skills that are associated with greater employability. The research design included: ethnographic observations in LAN-houses (Brazilian cybercafés), in the Brazilian states of Rio de Janeiro and Rio Grande do Sul; qualitative interviews of 45 users (30 urban and 15 rural) in one telecenter and nine LAN-houses in the state of Rio de Janeiro; and quantitative computer-based exercises administered to 303 LAN-house users in Rio de Janeiro and Porto Alegre. The study developed an "instrumentality index" to classify users into groups corresponding to different instrumental/non-instrumental activity mixes. It found that non-instrumental activities figured prominently in users' introduction to computers. While respondents' computer skills increased with overall computer use, the specific activity mix made little difference: "gaming" or "working," when pursued at similar frequency, lead to comparable types and levels of computer skills.

Interpersonal: The Impact of Cybercafés on the Connectedness of Children Left Behind by Overseas Filipino Workers

Interpersonal communication — via instant messaging, social networking, Skype voice or video chat, and a myriad other channels — figures prominently among the activities attracting users to public access venues. The Interpersonal study explored the impact of interpersonal communication activities in public access venues on family connectedness within selected Filipino families where parents are working overseas. It surveyed 308 children, equally split between urban and rural settings, whose parents work overseas, to measure how well they knew their parents' lives overseas, whether they thought their parents knew their lives back home, and how they perceived their parents' efforts to better understand and monitor their own lives. The study found that internet access increased family connectedness, and in particular, that *frequent and convenient access* made a greater difference. Importantly, it found that private access in the home or via a child's mobile phone was vastly superior to access in a public access venue, because of the greater convenience and privacy of home access. While family connectedness generally strengthens social cohesion, in this particular case it also makes it possible for Filipino workers

to pursue employment opportunities overseas while taking an active part in the education of their children.

Mobile: Public Access, Private Mobile — The Interplay of Shared Access and the Mobile internet for Teenagers in Cape Town

"If you have the internet in your pocket, why do you still visit a public access venue?" This question motivated the fifth in-depth study, exploring the information practices of public access venue users in South Africa's Western Cape Province. The study design included: interviews with 36 public access venue operators; detailed interviews and task analyses with 53 teenage users in six public access venues, including neighborhood libraries, larger central libraries, and cybercafés; and closed-end surveys with 280 public access venue users in Cape Town. It found that, overall, mobile phones and public access computers are no substitutes for one another: each corresponds to distinct activities and information behaviors, leading to different social, academic, or professional practices. In fact, the public users interviewed had developed elaborate, fine-grained practices combining the use of public access computers and mobile phones, taking best advantage of the complementary aspects of each. What the study did not find, however, was widespread evidence of synergies between mobile and public computer use, suggesting that there may be significant potential for greater integration of the two through adjustments in public access venue rules and services. Because mobile phone access is similarly exploding in many of the world's countries, this study's findings have broad international relevance. It suggests that while mobile internet access brings important benefits, it does not make public access obsolete.

Sharing, infomediation, & sociability: What is different about "public" access?

From even the most casual observation of users' activities in public access venues, it is obvious that social interaction matters, and that the public character of these venues makes interaction with others possible. Many users come to public access venues to be with other users, whether friends or family members, business associates, or new acquaintances. Many also come to get help from venue staff, librarians, or instructors who teach at the venue. Whether they seek help or company, the social interaction that takes place in public access venues is an important draw. A defining characteristic of public access is that it makes such interaction possible. The broad user survey asked respondents to choose the *main* reason why they use public access venues, and found that 18% of respondents came to be with other users, and 9% came to get help (mostly from venue staff). (See Table 7.1.) While the responses varied among countries, shared space — "being with others," getting help, or simply having some company — constitutes an important draw of public access venues for more than one-quarter of respondents overall. Policy and funding decisions need to take these aspects into consideration.

Table 7.1: Main reason for public access use (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
No other option for computer access	15	26	9	10	12	16
No other option for internet access	33	22	20	42	48	32
To work or be with friends or other people	18	13	28	9	16	23
To get help from other users	2	2	3	2	2	2
To get help from venue staff	7	22	3	4	5	3
Better equipment than home or work	15	10	26	16	12	15
Other	10	5	11	17	5	9
Total	100	100	100	100	100	100

Note: n=4,970. Data from user survey.

The in-depth studies on shared access and infomediaries complement these general findings, by delving into exactly how and why users value the environment of sociability and support that public access venues can provide. The other in-depth studies also underscore the importance of social interaction in public access venues.

Study 1. Understanding shared access

In many African countries, where computer ownership and internet access are rare, most people use computers and the internet in public access venues, especially in cybercafés. This phenomenon is often considered a second-best alternative to private individualized access, and is presumed to reflect economic constraints. Further, when people share computers within a public access venue, they are generally assumed to be doing so to save money. The Global Impact Study's research framework set out to test these assumptions. The broad user survey found that economic reasons were not the primary reason for sharing: only 15% of respondents said they sometimes share computers with others at public access venues "to save money." The most frequent reason given for sharing was because it was "more fun sharing" (35%).

The Sharing study surveyed 150 users in two Accra cybercafés: one was large, business-oriented, and centrally located; the other was small, family-owned, and located in the suburbs of Accra. Going beyond a basic understanding of sharing as "two or more people using one computer simultaneously," one of the study's goals was to better understand what users mean by "working and being with others." Who shares computer and internet resources? Why? What practices have developed, with what impact? Are there ways for public access venues to leverage user interest in sharing to achieve greater impacts?

CYBERCAFÉS ARE SOCIAL PLACES

Both cybercafés are places where users come to interact with others. Half of the respondents usually come to the venue with other people — primarily friends, but also family members, and to a lesser extent business associates. Of those who come with others, 60% sat together, and 30% would follow what their

companions are doing. Two-thirds of the respondents say they usually meet people they know at the café. Ghanaian cybercafés are evidently important social meeting places. Moreover, the physical setting and the social norms of the cafés also allow visitors to interact with each other, even while working on separate computers.

ALL KINDS OF PEOPLE SHARE

People tend to share computers in Ghanaian cybercafés regardless of demographic variables. Age, sex, ethno-linguistic group, and wealth indicators had little or no effect on sharing practices. In contrast, the broad user survey — while it shows little variation in sharing by country, education level, or gender (see Table 7.2) — found that younger and poorer users tended to share more often.

Table 7.2: Frequency of sharing, by country (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Every time	4	4	7	3	3	5
Most of the time	6	11	1	5	7	8
Sometimes	18	22	11	22	18	17
Rarely	12	2	17	14	10	13
Never	60	61	64	56	62	57
Total	100	100	100	100	100	100

Note: n=4,709.Data from user survey.

Forty percent of the Sharing survey respondents reported that they had sometimes shared a single computer with others in the cybercafé, but only 2% said they always shared, while only 3% said they rarely shared. ***Three-quarters of respondents said they were interested in environments that support enhanced collaborative group work.*** Users also reported that sharing made their visits at the café more productive and fun. Furthermore, the study found only limited differences in responses between the urban and suburban cybercafé, suggesting that sharing practices cut across geographic boundaries.

THERE ARE MANY DIFFERENT WAYS TO SHARE

Public access enables different forms of sharing and collaboration, from the most simplistic (such as asking a café employee a quick question) to more formalized (such as meeting business partners and working together around a single computer) to fleeting and voyeuristic (such as glancing at a stranger's computer screen and noticing an interesting website). While nearly half of the respondents said they had "shared" a computer in the café, the study found that this referred to different sharing practices. For two-thirds of those who shared, it meant sitting close to one another at a computer. For a smaller number of respondents, it meant sharing the use of the computer, either alternating using the computer or having one person use it while the other(s) offered directions. Interestingly, for only one in five users sharing the computer included sharing the cost.

In addition to explicit sharing, however, the study also uncovered less direct forms of sharing. Cybercafé users were found to engage in voyeuristic sharing — looking over someone's shoulder and learning from watching what they are doing. The learning outcomes of this type of behavior are substantial: 39%

claimed that they learned to search the web by watching others; 43% said they learned to use email that way; and 18% said they learned how to type that way.

SHARING FOR LEARNING, NOT FOR SAVINGS

An important finding from the study is that **the main reason for sharing computers in public access venues is** not **to save money**, contrary to common assumptions. Less than 5% of respondents said saving money was their main motivation for sharing computers in public access venues. By contrast, almost three-quarters cited educational reasons: for 45%, the main reason to share was to learn from each other; for 28%, it was to teach others (Table 7.4). Further, 62% of those who reported sharing said they would continue to share even if public access venue services were cheaper.

Figure 7.1: Most important reason for sharing the use of a single computer
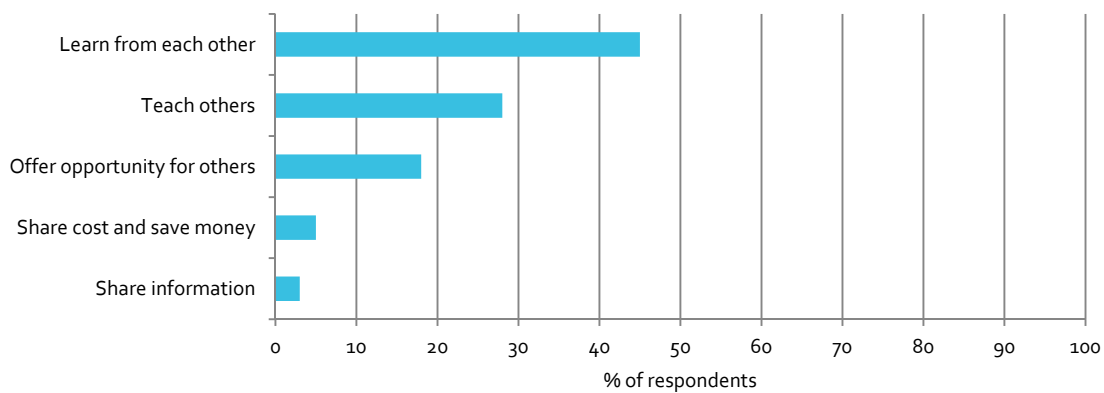
Note: Data from the Sharing study

While the question asked in this in-depth study was slightly different from that of the broad user survey, the finding is similar. Indeed, the user survey also found that (with the exception of Brazil and the Philippines) savings were the least often cited reason for sharing PCs, and this was consistent across all venue types (Table 7.3). The top two reasons for all countries combined ("more fun sharing," and "not enough machines") were not options in the in-depth study survey. Interestingly, in the Ghana data from the user survey the top reason for sharing was "to receive help from someone else," which is similar to the in-depth study's category, "learning from/teaching others." (See Table 7.4.)

Table 7.3: Reasons for sharing, all survey countries (%)

	All	Libraries	Cybercafés	Telecenters	Other
More fun sharing	35	30	39	25	33
Not enough machines	22	34	11	53	22
To receive help from someone else	20	20	22	15	23
To save money	15	8	19	4	11
Other	8	8	9	3	11
Total	100	100	100	100	100

Note: n=1,846. Data from user survey.

Table 7.4: Reasons for sharing, Ghana (%)

	All	Libraries	Cybercafés	Telecenters	Other
To receive help from someone else	39	43	39	39	47
More fun sharing	31	43	31	15	33
Other	13	0	14	8	0
To save money	9	0	9	7	13
Not enough machines	8	14	7	31	7
Total	100	100	100	100	100

Note: n=349. Data from user survey.

An obvious form of collaboration is asking for help. Eighty-six percent of respondents reported asking for technical assistance from the cybercafé staff, while 37% said they had asked for help from friends or acquaintances; only 15% had sought help from strangers. Those who shared were much more likely to ask for help from strangers. Intriguingly, respondents were four times more likely to report that they had provided help to a stranger than that they had received help from a stranger.

In another important finding, ***68% of users reported that sharing made coming to the public access venue more productive***, while 37% said it made public access venues more fun. All users cited email as the most important activity, but sharers also mentioned social networking and commercial or business collaboration, in that order. Overall, users had strong positive and instrumental motivations for sharing (e.g., learning, more productive) rather than negative ones (e.g., avoid costs, no other option).

SHARERS BEHAVE DIFFERENTLY

While their demographic profile was not significantly different from that of non-sharers, respondents who identified themselves as sharers tended to have different attitudes and behaviors. They were more likely to come to the public access venue with others and more likely to seek help from strangers. They

also tended to be less concerned about privacy and less likely to mind others looking over their shoulder for voyeuristic sharing. As there are significant differences between the motivations, practices, and goals of sharers and non-sharers, it seems important for public access venues to accommodate both — with areas for individual, private computing and other areas for collaborative shared use.

These findings are amplified by those of another in-depth study (Non-Instrumental), which found that the first use of technology emerges through social interaction and collaboration. People did not start out exploring ICTs on their own, but were introduced and guided by a socially significant other. Initial use emerged in the context of a social interaction — such as in school, LAN houses, or other public access venues — generally by sitting together at the same or adjacent workstations. Such use plays a role in the initial and continuing use of computers in Brazilian cybercafés. For example, for almost 10% of respondents, their initial experience of computing was in the context of collaborative use in a cybercafé. Of these respondents, 40% initially started used using computers together with someone else, in the cybercafé.

This phenomenon has implications for the design of public access venues, which are often structured as solitary spaces, with physical barriers between users and each cubicle designed for one user. Thus, even when collaborative use of the facilities is not explicitly banned, the design of the space inhibits collaboration (as do certain policies, such as discouraging the sharing of purchased time). Yet, sharing and collaborative use often flourishes in spite of the lack of encouragement and even discouragement. Both studies suggest that *public access venues should be understood in part as collaborative and interactive spaces*; a productive approach to their design would include developing information and communication technologies and applications — as well as spatial layouts — that support collaboration and group work in public access venues.

Study 2. Infomediaries

The presence of staff members available to assist users with technical or information needs is an important characteristic of public access venues. The Infomediaries study defines an infomediary as "a person who combines a set of technological resources and coaching to meet users' information needs and communication capabilities." It explores how they perform their role and add value for public access venue users. These infomediaries, who can provide an interface between users and information resources, include librarians, telecenter staff, and cybercafé employees. There is great variation among venues: in the extent to which assisting users is part of their responsibilities; in the training they may have received in preparation for that task; and in the extent to which they are compensated or rewarded for providing such help.

The user survey showed that while only 7% of public access venue users cite getting help from venue staff as their main reason for using a public access venue, about 40% of users have some occasion to seek assistance from staff, with 16% doing so every time or most times they go to a venue (Table 7.5). That proportion varies widely across countries, reaching a high of 70% in Bangladesh and a low of 22% in Brazil. In all countries however, public access venue staff assistance represents a significant draw for users, who consider it a very important feature of public access facilities (see Chapter 4, Figure 4.10).

Table 7.5: Frequency of seeking assistance from venue staff (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Every time	7	22	4	3	5	1
Most of the time	9	20	4	6	9	4
Sometimes	27	28	15	25	44	25
Rarely	24	15	33	23	14	34
Never	33	15	44	43	28	36
Total	100	100	100	100	100	100

Note: n=4,682. Data from user survey.

The survey also revealed a broad variety of user needs that drive them to seek staff help. While the most common are related to technical issues (usually for resolving problems using hardware or software), public access venue users also seek help related to other aspects of their personal, social, or political lives; 11% seek help with information searches on a range of topics including education, employment, and health (Table 7.6).

Table 7.6: Most common type of assistance requested from venue staff (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Problems using computer hardware	16	18	17	18	8	19
Problems with internet connectivity	45	35	35	39	62	52
Problems using software	19	18	27	22	14	15
Searching for employment, business, or work information	6	15	5	3	1	2
Searching for health information	1	2	.2	.4	.6	.9
Searching for educational information	3	2	4	4	3	5
Searching for online government services	.7	.4	.4	3	.1	.8
Searching for local or international news	.3	0	0	1	0	.3
Searching for culture and language information	.3	0	.2	.2	.6	.3
Performing communication activities, such as email	5	3	6	3	9	3
Producing online content, such as building websites	.8	.1	2	.8	.1	2
Other	3	6	4	6	2	.5
Total	100	100	100	100	100	100

Note: n=3,140. Data from user survey.

This study, comparing Bangladesh, Chile, and Lithuania, incorporates infomediary interviews, user focus groups, library manager interviews, field visits, and ethnographic studies.[30] In order to better understand the value of infomediaries, this in-depth study examines three key aspects of their role. First, it investigates the extent to which technical skills and empathy are relevant and appreciated by different categories of users. It then explores the influence of the public access venue context. Do infomediaries behave differently across different types of venues? To what extent do environmental and contextual factors (such as venue type or venue location) encourage or discourage various infomediary behaviors? Finally, it examines the extent to which infomediaries are able to adapt venue services in response to user needs.

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[30] The three countries provide a continuum with regard to the extent of internet penetration to the home and speed of connectivity, with Lithuania being among the highest in the world and Bangladesh among the lowest.

INFOMEDIARIES ARE ESPECIALLY IMPORTANT TO FIRST-TIME USERS

In all countries, users confirmed the need for assistance. A user's decision to visit a public access venue is based on a combination of reasons, including services, price sensitivity, and convenience. The effectiveness of infomediation services is an important part of the bundle, but not the driving one. While the top reason cited in the user survey for going to public access venues is the need for equipment and internet access, first-time users often go to public access venues seeking assistance. This is especially true in Bangladesh, a country in the early stages of information technology diffusion. The ethnographic information collected in this study confirms that the help first-time users receive from infomediaries is key to overcoming their initial anxieties. Infomediaries play a critically important role, as they provide a human face for the information age by performing the complementary roles of facilitation, coaching, referral, and teaching. In their absence, marginalized populations (due to age, socioeconomic status, level of education/literacy, gender, disability, or caste) would face additional, and perhaps insurmountable, barriers.

The study's evidence demonstrates that infomediaries contribute to developing the capacity and confidence among users to use and explore ICTs with increased independence. In all three countries, the empathetic competencies of the staff were particularly important for patrons with lower ICT skills. For novice users, empathy is more important than the infomediary's ICT skills, while for advanced users ICT skills are most valued, though some forms of empathy are also expected. Field work in Chile indicated differences in the perspectives of users and infomediaries: ***infomediaries perceived that users mainly sought their technical skills, whereas users expressed a need for empathy***.

THE IMPORTANCE OF EMPATHY

While survey responses stress the importance of staff's technical skills, this study's qualitative data show that infomediary empathy is important for novice and advanced users. Empathy is difficult to pin down. Indeed, users may not recognize it explicitly but instead may value a particular service which was provided in an empathetic manner. Thus, in the user survey, empathy is likely underestimated as it is captured through the responses to a variety of questions about infomediary services. For example, empathy is probably an important component of helping users search for information or helping those with a physical disability. More broadly, infomediation itself, when well done, is often invisible: successful infomediation is subsumed within the service provided and may not be noticeable to the user, so that surveys may underestimate its impact.

EMPATHY IS ELUSIVE

Empathy may best be described through examples of infomediary behaviors. It may include deciphering a user's individual needs, having a friendly and informal communication style, being flexible about rule enforcement, or demonstrating caring, sympathy, politeness, respect, patience, and goodwill. Scanning the public access venue environment to determine appropriate interventions for various users is also an important aspect. The study describes an infomediary who negotiated with venue users to tolerate one user who was conducting a job interview through a poor Skype connection; that infomediary also stood by the back-up generator to be able to turn it on immediately in case of a black-out. Another infomediary demonstrated empathy by patiently explaining what is possible or impossible to do on the venue computers and why, coaching a user through the preliminary steps for filing a visa application. Yet another described offering advice and referral to specific resources for advanced users, so he could spend more time assisting novices. Sometimes, what is needed is a willingness to bend the rules and take risks, such as allowing a user to upload important files from a USB drive. Or it could mean showing flexibility to make adjustments to the venue's environment, furniture layout, or schedule. The positive impact of such demonstrations of empathy underline ***the importance of a comprehensive approach to training***

infomediaries, to include attention to ways to minimize the intimidating effects of ICTs for novice users.

EMPATHY + SKILLS = GOOD SERVICE

The integration of empathy and skills is key to successful infomediation. An empathetic infomediary who doesn't have the skills to address users' technical needs would be as ineffective as one who has the skills but cannot understand the users' needs. Service excellence is about offering an appropriate form of empathy, along with a suitable set of skills that are matched to users' needs. For instance, leaving an advanced user to work on his or her own is an expression of empathy — especially if the infomediary has selected software or websites suitable for expert users to explore.

EMPATHY MATTERS IN ALL PUBLIC ACCESS VENUE CONTEXTS

Contrary to commonly held assumptions, the study's field work found little difference between for-profit and non-profit venues in the way they encourage empathy in their infomediaries. Empathetic service is evidently good business in all settings, and a "user-first" orientation is important to all types of public access venues. What is most valued are the skills and intuition that successful infomediaries apply in catering to different types of users. Infomediaries who are business savvy learn to cater to different users' needs and adjust schedules, pricing, venue layout, and equipment in order to enhance user satisfaction, in for-profit and non-profit venues alike. What matters is not the type of public access venue but rather the extent of leeway allowed to infomediaries — as well as their own initiative — to experiment and make adjustments.

VENUE LAYOUT MATTERS TO INFOMEDIATION

The arrangement of furniture and the disposition of computers inside public access venues made a significant difference to the quality of infomediation. Open layouts allow coaching by infomediaries, whereas partitions make it harder, discouraging empathy. In Lithuanian public access venues, infomediaries showed initiative by decorating the venue and organizing a photo contest. These efforts proved important in making the users comfortable. The Sharing study also found that venue layout affected interaction among users and had impacts for the user experience. Designing and laying out public access venues in ways that foster interaction, both among users and with venue staff, is an important way for public access venues to create distinctive value for users.

INFOMEDIARY RESPONSIVENESS MATTERS

The study's fieldwork identified many instances of infomediary services adapting in response to the perception of users' needs. In Bangladesh, proactive infomediaries suggested innovative approaches, such as bundling visa services or providing specialized support to farmers (e.g., sending photos of pest problems to agricultural experts). The Bangladeshi Infoladies represent a notable adaptation: specially trained rural young women bicycle five to ten kilometers a day — carrying an ICT kit (netbook computer with webcam, digital camera, and mobile phone with internet connectivity and headphone) — to offer information services at the doorstep of rural households. The study found somewhat less evidence of flexibility in Chile, because of budget cutbacks and institutional rules. Nevertheless, staff showed ingenuity in coping with constraints, making whatever adjustments they could.

Often, infomediaries help to discover latent user needs, a contribution likely to be underestimated in surveys. Because they are the main point of contact with users and they understand the technology's possibilities, infomediaries are in the best position to understand evolving user needs. Accordingly, the infomediary may be best placed to shape and implement organizational responsiveness.

The study indicates the value of granting infomediaries a degree of autonomy and flexibility, as an important way to enhance their impact. Public access venue management could introduce mechanisms that document and reward infomediaries who demonstrate a commitment to responsive service.

HIRING, TRAINING, AND REWARDING EMPATHETIC INFOMEDIARIES

Because empathy is harder to identify, hire for, and teach than technical skills, most public access venues focus on technical skills in their human resources and organizational decisions. Empathy is seldom part of the infomediary's job definition, as technical skills are. Infomediaries are tacitly expected to be helpful to users, but this is seldom spelled out as part of their professional duties. Similarly, infomediaries receive no specific training on empathy. The study found no evidence of formal mechanisms to encourage empathy by infomediaries or to reward empathetic behavior. The focus of infomediary training and job evaluation is on technical skills and quantitative measures.[31] The study found little evidence of tracking infomediary performance on the basis of quality of service. Moreover, while the study found countless examples of direct positive user feedback to infomediaries, it found no evidence of formal mechanisms to track or acknowledge users' satisfaction levels.

These findings were similar for all types of public access venues, whether for-profit or non-profit. The policy challenge is to identify criteria for staff selection and to develop training curricula that enhance a range of skills and attitudes.

FROM INFOMEDIARIES TO *INFOMEDIATION*

Infomediary characteristics often carry over to venue characteristics. Empathetic service creates an empathetic context, leading to effective user assistance. Effective infomediation — rather than effective (individual) infomediaries — seems to be a central factor in the institutionalization of effective practices, roles, and skills. **The effectiveness of infomediation appears to be venue-neutral**, in that the qualities of an effective infomediary will be less dependent on the type of venue and more on the ability of the venue to adapt to technological developments and changing user needs.

This study suggests that users, too, may be more concerned over time with a venue's infomediation process rather than the individual infomediaries. In order for venues not to become overly dependent on the talents of one individual, it is important to foster systematically the qualities that lead to good infomediation, such as attentiveness to users' needs, flexibility, and responsiveness.

Gaming, chatting, social networking: Do "non-serious" uses have impact?

When public agencies or foundations create public access venues, a primary rationale is usually to promote "serious" uses of ICTs: resources and applications that allow venue users to (for example) find economic, health, or educational information, write a report, create a CV, or simulate financial scenarios

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[31] The one exception was the training offered by the Chilean Biblioredes program for infomediaries that includes modules on empathy. However, this aspect was given less priority than technical skills training, and there was no attention to this dimension in the formal performance evaluation of staff.

for a small business. Yet a visit to any public access venue in most parts of the world will show that users are often there to play computer games, chat with friends and family, or update their Facebook page. The user surveys indeed show that various forms of "non-serious" uses, from gaming to social networking, represent a dominant use of public access venues (Figure 7.3).

Figure 7.2: Use of domains, by venue
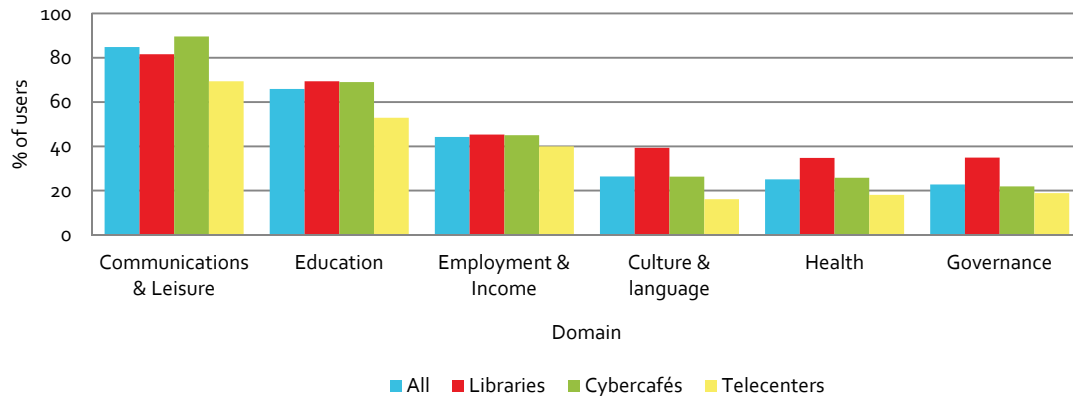
Note: Data from user survey

In a number of public access venues, such "non-serious" uses are discouraged or even forbidden. Such restrictions are more likely in libraries and telecenters than cybercafés. But are these non-serious uses of information technology necessarily pointless? This report suggests that they may have instrumental value for users, in two respects. First, users who are first attracted to using computers to play games or update their social network may go beyond that initial use to explore other ICT activities. Second, even the less serious uses of ICTs also generate familiarity with a range of aspects of information technology, promoting computer skills and possibly resulting in important impacts.

The next two in-depth studies examine such impacts in detail. The first study explores the extent to which "non-instrumental" computer use leads to the development of generic computer skills that are directly linked to employability. It finds little difference between the skills progress of "gamers" and "workers": the generic computer skills they acquire are largely identical and depend primarily on the extent of computer use. The second study examines communication and connectedness within families who are geographically separated. It finds that the ability to communicate through chat, video conferencing, or social networking matters a great deal for family cohesion. However, public access is often a poor substitute for private access in these areas. Together, these two studies argue *that "non-serious" computer uses can have important positive impacts* that need to be taken into account in setting public access venue policies.

Study 3. Non-instrumental computer use

The user survey found that, when asked whether use of public access computers for "non-serious" activities has improved their overall ICT skills, users consistently report positive impact (see Chapter 5, Figure 5.32). The Non-Instrumental study found detailed evidence of the usefulness of such "playful" computer activities as social networking and gaming, in public access venues. The study builds on findings from the "serious games" and "games and learning" literature.

PARSING OUT NON-INSTRUMENTAL USES

There is no generally accepted agreement on what constitutes instrumental vs. non-instrumental computer use. The prevalent approach public access venues take to distinguish between instrumental and non-instrumental ICT uses is based primarily on what software application is involved. The Global Impact Study found similar kinds of distinctions in all countries: word processing and spreadsheets are good (to be encouraged), while games and internet chat are bad (to be discouraged or prohibited). In practice, the lines are more blurred, as **almost any application can be used for either instrumental or non-instrumental purposes**. For example, email is used for both instrumental purposes (messages related to work or school) and non-instrumental purposes (communicating with friends and family). Instead of the standard dichotomy, this study asked users to describe their purpose as instrumental or non-instrumental or both, for each activity they engaged in from a list of specific activities. The results were used to define an "instrumentality index" for applications based on user motivations, as well as a classification of users according to the purpose of their activities.

INSTRUMENTALITY INDEX

The study asked respondents whether they engaged in each of 14 common computer-based activities, and whether their use was for work/school or for personal use/fun. The instrumentality index was created based on the percentage of respondents responding "work or school" for a specific activity, relative to the percentage responding "personal use or fun." (Note that respondents were allowed to select both answers.) Thus, scores greater than one indicate activities that are done more often for instrumental purposes, while scores less than one indicate activities that are done more for non-instrumental purposes. The study found that three activities are most clearly instrumental: create computer presentations, create or use spreadsheets, and create documents with a word processor (in decreasing order of instrumentality). Another group scored around 1, indicating that they are equally used for instrumental and non-instrumental purposes: searching for Information online, using email, or creating web content. Playing computer games and using social networks fell clearly in the non-instrumental end of the scale.

Figure 7.3: Instrumentality index for various computer activities, based on users' purpose
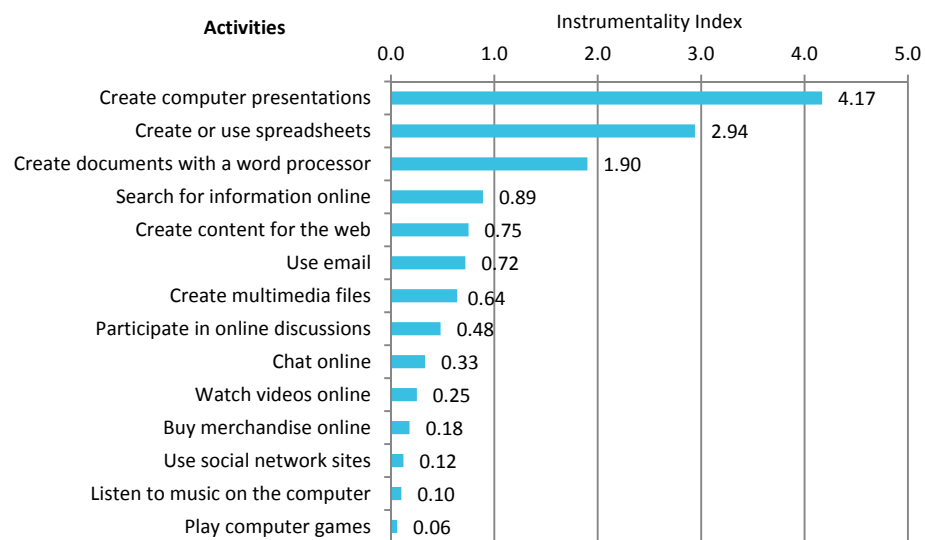
Note: Data from Non-Instrumental Uses study

Some activities are closely matched to specific computer applications. For example, since "create documents with a word processor" shows an instrumentality index of 1.90, "word processor application" is likely to be an instrumental application. Interestingly, however, the study found that *all* activities had at least 6% of users for whom it was instrumental in purpose (including "play computer games"), as well as at least 22% for whom it was non-instrumental (including "create computer presentations").

The instrumentality index will vary depending on the population surveyed. A particular activity's index is true for that population (or other populations with similar characteristics), and does not hold as an absolute measure of instrumentality. For example, while "using social network sites" was non-instrumental for the surveyed LAN house users, other populations may use social networking as an instrumental part of their professional network development. Nevertheless, the three activities ranked as primarily instrumental (create computer presentations, create or use spreadsheets, create documents with a word processor) match three commonly accepted "serious" office applications (presentation, spreadsheet, word-processor); they are typically among the activities that public access programs and policies seek to promote as "productive." They also correspond to the skills employers look for in prospective employees. The study included computer-based exercises that focused on tasks related to two of these clearly instrumental activities, spreadsheets and word processing.

USER PURPOSES ARE NOT STATIC

A user's purpose can change over time. Participants varied in both how they were introduced to technology and how they continue to use technology. Fully 62% of participants indicated that they use the internet for *more* than just games. Frequently mentioned activities were: research for school and for work, email and social networking, and chatting online. Although participants started using technology for certain reasons, many expanded their skills for new purposes. One participant explained that "schoolwork ended up demanding [that I use computers] and I began to learn more games." Inversely, another participant was first interested in technology "for gaming, but today it is more for studies." Another participant blurred the lines between instrumental and non-instrumental use, explaining that she simultaneously "learned to install games, get on the internet, and type." The diversity of experiences and the different means of progressing to different uses indicate that users in Brazilian LAN houses have an expanding relationship with technology. They are initially exposed to it for a variety of reasons, and they gradually expand their knowledge to engage in many different uses. The synergy between serious and playful uses for many respondents underlines the value of policies that enable both.

CASUALS, PLAYERS, WORKERS, AND POWER USERS

Based on the profile they provided of their own use, and the relative weight of instrumental versus non-instrumental usage, users were characterized by the number of instrumental activities they cited (e.g., using email for work or school) and the number of non-instrumental activities (e.g., emailing friends or family). Figure 7.4 charts the study's population along these two axes, with the size of each circle representing the number of respondents with a specific mix and number of instrumental and non-instrumental activities. Respondents were then categorized as Casual Users, Players, Workers, or Power Users, based on their position below or above the mean in each axis dimension. Casual Users were found to engage in the fewest activities overall; Players engaged mostly in non-instrumental activities, Workers mostly instrumental activities, and Power Users engaged in many activities of both kinds.

Figure 7.4: Typology of users based on mix of instrumental and non-instrumental activities
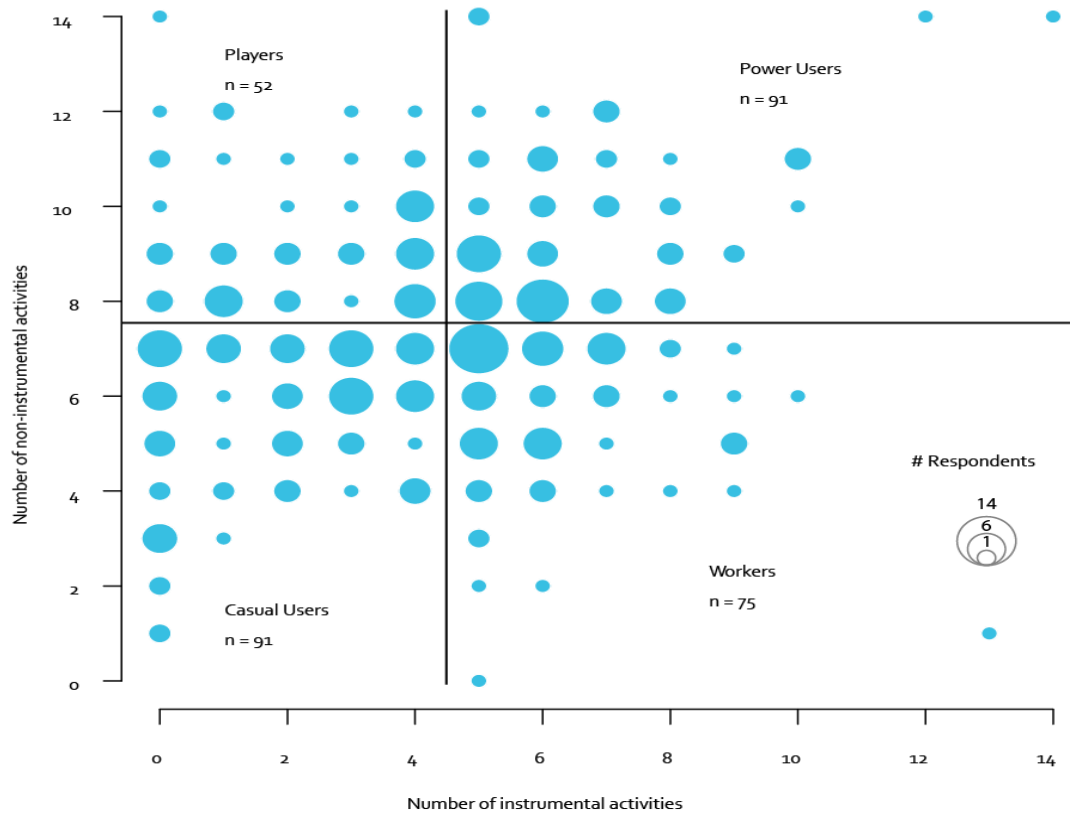
Note: The x and y axes represent the mean number of each kind of computer activity (instrumental and non-instrumental).
Data from Non-Instrumental Uses study.

NON-INSTRUMENTAL USERS FIT THE TYPICAL TARGET OF PUBLIC ACCESS PROGRAMS

Overall, non-instrumental activities are particularly prevalent among younger, lower-educated, less experienced users, who are also less likely to have home access. These users are among the main targets of many public access programs. Based on the patterns of change shown in the study's observations, these users will likely increase their instrumental use and improve their instrumental ICT skills.

The characteristics of the four groups of users are consistent with what most observers would expect. Casuals and Players tended to be younger, while Workers and Power Users tended to be older. Players tended to have a lower education level than Workers. Casual Users have the least computer experience (6.6 years), followed by Players (8.4 years), Workers (10.8 years), and Power Users (11.8 years). Overall, 85% of users had a computer at home and 70% had access to the internet, with Casuals ranking lowest and Power Users highest. The minority of users who lacked home access to both internet and computer fell into the Casual User group and were found to engage only in non-instrumental activity.

However, in several important characteristics, there are surprises. Players and Workers had similar rates of home computer and home internet access. And, perhaps most notable, ***there were no significant gender differences among the four groups*** (the overall population included one-third females, two-thirds males).

Technology & Social Change Group

INFORMAL LEARNING IS MORE PREVALENT THAN FORMAL TRAINING

Many more respondents reported learning informally, from friends and family, than through formal training. The top three instrumental activities (presentation, spreadsheets, and word processing) are the ones for which respondents reported the most formal training (about one-third of respondents). By contrast, informal learning is prevalent for multimedia use, music, and video, as well as social networking (about three quarters of respondents). Players were most likely to report informal and self-training, workers most likely to report formal training. This suggests that public access venues could offer options that include training and a co-presence environment that facilitates informal training The Infomediaries study confirms this finding, observing that some of the best training programs in Chile have developed such choice strategies.

The study's qualitative findings show that most Brazilians do not turn to formal education as a means for gaining computer knowledge and skills. Instead, many pick up this knowledge from other resources, including friends, neighbors, family, and, most importantly, in the LAN houses. The Sharing study similarly shows that informal learning is prevalent in Ghanaian cybercafés. While individuals indicate an eagerness to gain new skills, many are more interested in learning through technology exploration and engagement within their social network, rather than learning for its own sake.

In line with the findings of the user survey, this study found that users are more likely to share their skills with friends than strangers and are quite unlikely to share within formal workshops. It found that Power Users were the most likely to share, followed by players, then by Workers and Casual users.

Social networks are thus paramount to transferring computer knowledge. First, informal learning from friends was the most prevalent mode of training, across all activities. Second, those participants who shared their expertise with friends tended to share that expertise across a whole range of activities and were, perhaps as a result, often more advanced users. Together, these findings underscore the importance of informal social learning, especially considering the finding that those who share their expertise are willing to do so in both instrumental and non-instrumental activities. Players as a group benefit the most from informal learning environments. They are the most likely to learn computer skills informally, the second most likely to share their expertise with friends (after Power Users), and the most likely to share their expertise with strangers. For members of this group, a public access venue that provides a sociable computing environment is more conducive to the development of computer skills.

Similar findings emerged in the study of Ghanaian cybercafés. Findings from these two different contexts, Brazil and Ghana, confirm this study's hypothesis: ***in some cases, public access venues are much more than an inferior substitute for private access***. Public access venues can provide alternative learning paths for younger, poorer, and less educated users, who tend to develop their skills most readily through informal and play-oriented collaborative learning with their peers.

NON-INSTRUMENTAL USE BUILDS INSTRUMENTAL COMPUTER SKILLS, THUS BOOSTING EMPLOYABILITY

One of this study's key findings concerns the impact of computer use practices on computer skills. In order to evaluate the skills of various categories of users, the study tested a sample of LAN-house users, asking them to perform 16 tasks primarily associated with instrumental activities: 9 word processing tasks, 3 spreadsheet tasks, 2 web search tasks, and 2 email tasks. These tasks were chosen to correspond to what local employers would typically expect for entry-level office jobs, to provide a rough indicator of employability.

Overall, performance on the various tasks correlated with group categories. Overall, Casual Users were most likely to fail at the tasks, while Power Users were more likely to succeed. Interestingly, there was no

significant difference between Players and Workers: the two groups performed similarly on most of the tasks. The study further found that users who engaged in a greater number of *non*-instrumental activities performed better on the test. This was true both of users who engaged in a variety of activities and of those who engaged in only non-instrumental activities. Similarly, the study found that users who engaged exclusively in non-instrumental activities at a high level performed at least as well as those who had a high level of instrumental engagement. In short, **non-instrumental computer use and instrumental computer use had similarly positive impacts on instrumental skills development**.

The study further examined whether users' pattern of engagement for instrumental or non-instrumental reasons made a difference to their success on the test. It found that success on the test varied depending on their reasons for engaging in these activities. Engagement for non-instrumental reasons was associated with lower rates of success than engagement for instrumental reasons. Importantly, users who engaged in these activities for both instrumental and non-instrumental reasons tended to perform best: for a given activity, *adding* non-instrumental use (i.e., play) was associated with greater skill levels. This suggests that banning or limiting non-instrumental activities may be counter-productive, in terms of skills impact.

Many public access venues place greater value on activities like word processing (to prepare a job application) or spreadsheets (for budgeting), and attach little or no value to gaming or social networking. These choices reflect an understanding of what constitutes appropriate use of technology — and of public monies. This study shows that this is in fact not the most effective approach to raising the skills of broad segments of the public access venue user population, particularly the most marginalized groups. The users of Brazilian LAN-houses who engage mainly in non-instrumental activities in fact develop useful, employable computer skills in equivalent ways to users who favor instrumental activities. Moreover, for all users, engagement in *non*-instrumental activities enhanced their instrumental computer skills. The most important factor was the variety of activities users engage in, not their formal training, and not whether they perform instrumental or non-instrumental activities.

Public access venues that allow community members to engage frequently with computers in a range of activities are most likely to provide the opportunity for people to gain the skills commonly associated with employability. Policies that restrict activities such as gaming or social networking — especially common practices when facilities are busy — may be limiting skill acquisition that translates to instrumental use. Loosening these restrictions in public access venues like telecenters and libraries — where policies tend to be stricter than in LAN houses and cybercafés — can potentially facilitate skill acquisition by a broader range of users. The Infomediaries study found that public access venues in Chile and Lithuania which allowed gaming would also schedule quiet periods to accommodate other users (older patrons in particular).

Study 4. Connectedness of children with migrant parents

Much like gaming and social networking, interpersonal communication activities (chat, Skype voice or video calls, instant messaging) are often limited or banned in libraries and telecenters. Yet according to the user survey, the activity with the greatest overall frequency of use, as well as the highest percentage of perceived impact reports, is communicating with family and friends.

The Interpersonal study explores the impact of interpersonal communication activities in public access venues on family connectedness among Filipino families, focusing on the children left behind by overseas Filipino workers. This is an important study site because of the large population concerned: one-tenth of the Filipino population works abroad, and a large number of Filipino families are geographically separated. Many rely on the internet and on public access venues for family communication.

The study uses three classic indicators of connectedness: children's knowledge of their parents' lives overseas; the parents' knowledge about their children lives at home; and the parents' ability to monitor their children's activities and their efforts to know more about them. Findings draw from a survey of 308 adolescent and young adult children left behind (158 in an urban setting and 150 in a rural community) to measure their perceptions of these three aspects, as well as focus group discussions with parents who had lived abroad. Interviews with 15 cybercafé managers (seven urban and eight rural) complement the survey with qualitative insights.

INTERNET USE INCREASES FAMILY CONNECTEDNESS

All but 8% of youth respondents used the internet, and almost half had no home access and relied exclusively on cybercafés. Moreover, two-thirds of those with home access also used public access. Overall, 70% of the surveyed youth used the internet to communicate with their parents abroad. *The families using internet for communication were significantly better connected than the families of overseas Filipino workers whose children did not use the internet to communicate with their parents*: children knew more about their parents' lives overseas, felt their parents knew more about their lives at home, and believed their parents made greater efforts to know more about them. The study examined the impact of diverse communication applications: real-time chat, messaging, social networking (including Facebook), email, and video-chat.

- All applications except video-chat were found to significantly improve youth knowledge of their parents.
- Only chat and messaging significantly improved their perception of parental knowledge.
- All applications except social networking and video-chat significantly improved their perception of their parents' efforts to know more about their lives and to exert some control over their activities.

The qualitative input from focus group discussions provided insights into possible reasons behind the variations. When seeking knowledge about their parents' lives, youth are in control and they avail themselves of a broad range of communication tools. By contrast, they often find that the informality and real-time character of chat and messaging make it easier to convey what it going on in their lives to their parents abroad, as compared to email or Facebook. Several, however, reported reluctance to discuss difficult topics — trouble at school, personal problems — through real-time applications, preferring the time for reflection afforded by asynchronous communication. Facebook monitoring is also an important way for parents to know about their child's life, often followed up with chats or voice conversations to provide background details. Interestingly, video-chat showed no significant impact for any of the three indicators. Those who used it reported conflicted feelings: while it was nice to see distant family members in their environment, it could also provide a painful reminder of their physical separation. It also required a somewhat awkward setup in public access venues.

PRIVATE ACCESS HAS GREATEST IMPACT ON CONNECTEDNESS

While internet use increases family connectedness, the kind of internet access makes a significant difference to the magnitude of impact. Across all three indicators, the study found the smallest impact for youth who used the internet only in public access venues. *The greatest impact was reported by youth who used the internet only at home.* Surprisingly, for those who used the internet both at home and in public access venues, impact levels fell somewhere in between. The differences between use at home or at public access venues was much more pronounced for rural youth, and virtually disappeared in the urban context (as discussed below).

The focus group conversations helped understand this apparent paradox. Youth who only used computers at home did so by choice, since they could go to public access venues if they chose to. In their case, home access proved satisfactory for the task at hand. By contrast, when youth with home access chose to go to a public access venue, they did so because their home access was less than ideal: their home computer might be unavailable because other family members are using it, or they might be seeking privacy away from family members. Whatever the reason, they missed out on important benefits from home use for family connectedness. Some youth complained about the public access venues' noisy environment. Parents in particular appreciated the convenience of their child's home use to enable impromptu, unscheduled conversations "whenever they are on Facebook," or to deal more easily with the time difference between their host and home countries. By contrast, families needed to coordinate schedules when they wanted to interact in real-time from a public access venue.

This impact ranking (home only > home + public > public only) holds true to a significant degree for almost all interpersonal ICTs in the survey: Facebook, text chat, voice chat, video-chat, and internet in general. The exception was email, where the result was not statistically significant. The superiority of home access to maintain family connectedness was a motivation for many overseas Filipino workers to purchase home computers. Many overseas parents also cited the importance of family connectedness as a key motivation to learn about the internet.

INTERNET USE HAS GREATER IMPACT ON FAMILY CONNECTEDNESS IN URBAN THAN RURAL AREAS

The study found that the positive impacts on family connectedness were much greater for urban than for rural respondents. Especially for rural users of cybercafés who lack home computers or other public access, there was no significant impact on any of the three indicators of connectedness.

Conversations with youth explained this by the far greater convenience of cybercafés in urban than in rural areas. Indeed, cybercafés were densely distributed within the urban neighborhood of the study, even more than expected: the field researchers found many public access computers that were not on their list of known cybercafés in the neighborhood. As a result, cybercafés almost match the convenience of home computers in urban settings — located within easy walking distance from respondents' homes, sometimes even within a few feet of their doorstep. For rural users, by contrast, getting to the cybercafé involves travel time and costs, creating significant hurdles. These are all the more important for the synchronous communication activities that are key to family connectedness, since they make coordination all the more difficult. One rural youth said that, between travel time and time-zone difference, he and his mother were barely able to talk once a week.

In fact, within the urban setting, there was no significant difference in impact among the three internet access modes (home only, public access venue only, home and public combined). By contrast, in the rural setting, the "home only > home + public > public only" ranking holds true both for children's knowledge of parents and for perception of parental knowledge. (The results for parental effort to know/monitor children's life were not significant.)

CYBERCAFÉ-ONLY USERS

Even though public access was less effective than private access for maintaining family connectedness, it is still critical for those youth who do not have an alternative. For cybercafé-only youth users, the study found, again, important differences between urban and rural settings. In urban cybercafés, youth use of text chat, voice chat or email to communicate with their overseas parent had a significant impact on knowledge of their parent, while only voice chat proved to have significant impact on their perception of parental knowledge, and none showed significant impact on perceived parental effort to know their

child. In rural cybercafés by contrast, there was no significant impact on any of the three indicators of connectedness.

Again, the qualitative findings provide some confirmation that (1) synchronous interaction is most impactful and that (2) using synchronous applications is much easier in urban settings, where cybercafés are easily accessible. Urban parents described how they use cell phones, either through texting or calling, to tell their child to go to the nearby cybercafé, when they are available to chat with them.

PUBLIC/PRIVATE USE

Youth who have both private and public access have developed sophisticated practices combining the two, similar to those observed among South African youth (Mobile study). Which they prefer — home computer, mobile phone, or public access computer — depends on timing, activity, and context. This echoes the findings from the user survey and supports the framework hypothesis, that private use is not always superior to public use and that the two can be complementary depending on the user's purpose.

The youth surveyed reported preferring public access venues when they seek better equipment or faster connections, as well as when they want to be together with friends. However, within the context of family communication, many subtle factors come into play. Privacy is an important consideration, but this cuts both ways: public access venues are more private when youth prefer not to be overheard by siblings or the parent they live with, but home computers at times give them privacy from noisy cybercafés. Private mobile phones are often used to coordinate real-time chats with parents abroad, which then take place in cybercafés. The choice of application is affected by similarly complex preferences. Asynchronous text messages can be better than real-time chat or video conference when confessing some misbehavior, giving the overseas parent time to digest the news. In general, however, real-time interaction is preferred for informal impromptu communication. Application preferences can in turn affect the choice between a private or public setting.

MOBILE PHONE INTERACTION HAS GREATER IMPACT THAN INTERNET ON FAMILY CONNECTEDNESS

To further explore the importance of frequent, real-time, impromptu interaction, the study compared frequency of mobile phone and internet use. The impact of frequent mobile phone use on the youths' knowledge of their parents appears to be much greater (and at a higher significance level) than internet use, both in urban and rural settings. Text chat and voice chat were the most important internet applications in urban settings, though neither showed significant impact in rural settings. For the other two indicators of connectedness (parental knowledge of child, and parental effort to know their child), the only communication mode showing significant impact was frequent mobile phone use.

Focus group discussions confirm that frequent mobile phone interaction constitute the most direct way to maintain family relationships, because of the convenience, privacy, and spontaneous conversations they allow. However, frequent mobile phone use remains an expensive option, and access to the internet (via computers) continues to be an important mode of communication for children of overseas Filipino workers.

The importance of private access, whether home access or mobile phone access, to maintain family connectedness in this study contrasts with users' preferences as identified in the Non-Instrumental and Sharing studies, favoring shared, sociable public access. This further highlights the complementarity of public and private access. Depending on circumstances and purposes, users may prefer one or the other, or they may use each to pursue distinct benefits. Again, the in-depth studies confirm the framing

hypothesis that public access is not simply a temporary substitute for private access. Both play important roles in the user's communication toolkit.

Study 5. Public access, private mobile

Mobile phones are now broadly available throughout the developing world, prompting the question whether they might eventually obviate the need for public access venues. When everyone has a private information device in their pocket, is there still a need to provide public access to ICTs? The broad user survey confirmed that most public access venue users (96% overall) have access to a mobile phone within their household. For most respondents, using a mobile phone is no longer a novelty; in fact, a large majority of public access users (88% overall) report using a mobile phone daily or almost daily. While there are minor variations between countries, the quasi-universal availability and use of mobile phones by public access venue users is remarkably consistent across the countries in the study (Tables 7.7 to 7.10).

Table 7.7: Public access users: mobile phone at home (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
No	4	4	5	5	2	4
Yes	96	96	95	95	98	96
Total	100	100	100	100	100	100

Note: n=4,977. Data from user survey.

Table 7.8: Public access users: first use of mobile phone (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
6 months ago or less	3	3	2	2	3	4
7-11 months ago	2	3	1	.2	2	3
1-2 years ago	9	16	7	4	10	10
3-5 years ago	23	28	20	20	21	22
Over 5 years ago	61	48	69	73	59	58
Never used	2	2	1	1	5	2
Total	100	100	100	100	100	100

Note: n=4,993. Data from user survey.

Internet use on mobile phones is far less common. Mobile internet access remains a luxury (albeit increasingly common) in the developing world: 58% of public access venue users report they have never used the internet on a mobile phone. Only 16% overall say that using mobile internet is an everyday experience. However, there are substantial international variations. In Chile, 71% report never having

used mobile internet, while in Ghana, almost the same proportion (73%) has used the mobile internet, and 56% say that this is a daily or weekly practice.[32]

Table 7.9 Public access users: frequency of mobile phone use (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Daily or Almost Daily	88	91	83	88	91	87
At Least Once a Week	7	5	13	8	3	7
At Least Once a Month	2	2	2	2	2	2
A Few Times a Year	.5	.3	.5	.5	.4	.8
Never	3	2	2	2	4	4
Total	100	100	100	100	100	100

Note: n=4,955. Data from user survey.

Table 7.10: Public access users: frequency of accessing internet on a mobile phone (%)

	All	Bangladesh	Brazil	Chile	Ghana	Philippines
Daily or Almost Daily	16	15	11	5	36	13
At Least Once a Week	13	10	10	6	20	15
At Least Once a Month	6	5	3	7	8	6
A Few Times a Year	7	3	10	11	9	6
Never	58	67	66	71	27	60
Total	100	100	100	100	100	100

Note: n=4,778. Data from user survey.

The Mobile study explores mobile internet use in South Africa, focusing on older teenagers who use public access venues in low-income neighborhoods of Cape Town. It is based on a combination of approaches: semi-structured interviews with 36 public access venue operators; detailed interviews and task analyses with 53 teenage users in 6 public access venues, including neighborhood libraries, larger

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[32] There are indications that the Ghanaian respondents may have overstated their mobile internet use, so these data should be treated with caution.

central libraries, and cybercafés; and a closed-end survey with 280 public access venue users in Cape Town.

The implications of public access venue use for this particular demographic are especially important, as older teens confront a range of information-related challenges associated with the transition between school and either tertiary studies or a daunting job market. Only one in eight South Africans between 18 and 25 years of age succeeds in finding formal employment.

South Africa has 49 million people — and over 50 million mobile subscriptions. As a relatively early adopter of "mobile-centric" internet use, South Africa is a good setting to explore the role of public access in an increasingly mobile age. Urban South Africa is among the few places where mobile internet use is almost as common as basic mobile phone access even for resource-constrained users. Driven by MXit and more recently by Facebook, mobile internet use in urban South Africa is common on feature phones, even among the poor.

While South Africa is on the leading edge of mobile-centric internet use, mobile centric does not necessarily mean mobile-only. The study finds that overall, mobile phones and public access venue computers do not substitute for one another: each is used for a distinct set of activities and information behaviors, associated with different social, academic, or professional practices. The public access users interviewed had developed elaborate, fine-grained practices combining public access computers and mobile phones, taking maximum advantage of their complementary aspects. Public access venues provided them unique and even indispensable services, for which the mobile internet is no substitute. The study did not find widespread evidence of synergies between mobile and public computer use. There may be a significant potential for greater integration in the use of these two channels of communication, through adjustments in public access venues' rules and services.

PUBLIC ACCESS VENUES AND MOBILES ARE COMPLEMENTS, NOT SUBSTITUTES

Almost all 280 public access venue users surveyed own a cell phone (90% of teens and 95% of adults), and almost all of them used it to access the internet in some form. However, while 82% of adults interviewed had brought their mobile to the public access venue, only 56% of teens did so. They were concerned about theft, or they had come to the venue straight from school, where mobile phones are generally banned. Only about a third (37% of adults and 32% of youth) had purchased data bundles; the majority had more expensive forms of data access, that they made use of only infrequently.

Respondents described very different uses for mobile phones and public access venue computers. They reported using some applications only on one platform: word processing is always used on a computer; MXit (a Java-based GPRS "internet-lite" chat application, developed in South Africa) is almost always used on a phone rather than on a desktop MXit client. Other applications are "cross-platforms," such as Facebook and Google search. Even there, practices varied depending on the platform, favoring mobile phones for quick focused Google searches and computers for more in-depth research sessions. This division reflects the fact that public access computers and private mobile phones offer very different affordances. Among low-income users, free use (as in a library) supports the more resource-intensive activities that require storage space, time, bandwidth, as well as stable media production. Paid use, via mobile phone, supports time-sensitive activities as well as various forms of inter-personal communication and low-bandwidth media use.

In response to these differences, teenage users have developed complex, fine-grained practices which help them to negotiate the respective strengths and weaknesses of public access and private mobiles.

These include practices that help to minimize costs and maximize convenience, displaying a keen sense of which affordances or use settings will be more productive to reach given goals.

These practices respond to a broad range of factors, including:

- The **respective costs** of various access modes:
  For teens, the public library often served as a fallback when cash or airtime had run out. One user explained that she alternated between computer and mobile internet, depending on whether she had airtime: "I use a computer when I do not have airtime and I use cell phone when I have airtime."
- The **capabilities of each platform:**
  Youth realize that mobile phones are not great for downloading complex pages needed for homework or document production. Web pages, often designed for computers and broadband, download painfully slowly on a phone. In addition, the need to multitask, print, or display large images requires the use of a computer rather than mobile internet access.
- The **purpose** of the activity — for school or for social networking:
  Schoolwork is mostly done on computers. Mobile phones are seldom used directly for schoolwork, except as a backchannel to discuss homework with classmates. MXit is used almost exclusively on mobile phones for social networking and constant contact with peers, associated with instant messaging.
- The **granularity** of communication activities:
  A quick search or message is normally done on phones for convenience, or to avoid paying for hourly public access. The phone allows micro-access and micro-coordination activities.

Overall, the study finds that the respective constraints and possibilities of public access and mobile access shape distinct information practices and lead to different information literacies. Public access fosters interests and digital literacies associated with large-format document production and use of hyperlinked media, which involve more extensive computer and internet use and entail significant expenditure (using paid access). By contrast, mobile internet access supports everyday social literacies and messaging (which require responsiveness and frequent use), as well as off-line media use. Some respondents also describe how libraries' pressured environment, allowing each user only 15 minutes of computer time during busy periods, leads to quick-turnaround search-copy-paste-print routines. In other cases, taking longer periods at the computer (as at the internet cafés) or, alternatively, the discipline of regular visits to the library, well before project deadlines, allows more sustained productivity: the collection and editing of online information; the development of visual designs, using word processor or another program; and integration with handwritten and photocopied material.

Public access venues provide indispensable resources to many users, for whom the mobile "internet in their pocket" is not a viable substitute. Public access venues offer safe, quiet spaces with low-cost or free (subsidized) airtime as well as large screens. The school-related tasks that teens are assigned are significantly easier to complete at the computer. One respondent observed, "All the work at school requires you to get information here at the library." The study finds that for these youth, connected libraries are used primarily for "serious" uses and schoolwork.

The critical importance of public access venues for accomplishing homework assignments may reflect conditions specific to South Africa: researchers noted a severe mismatch between the South African school curriculum, which requires project-based learning, and the limited availability of learning resources in state schools, such as computers, books, and libraries. Library and web resources are needed

for schoolwork. Home, moreover, is often not a quiet or convenient place to do homework. In the study's survey question about the importance of various public access venue attributes, "safe/quiet/convenient place" was cited most often, after "affordability." This factor was mentioned much more frequently than "cquipment quality," "connection reliability," or "my friends are there." This finding is echoed by public access venue operators, who cite as a major benefit of their venue the ability to help users with homework, job search and employability. It also confirms findings from the Infomediaries study, which found that users who had personal access to a mobile phone still sought infomediation services in public access venues.

When asked which they would use, for a series of individual tasks, if forced to choose between public access computers and private mobile, respondents confirmed this non-substitutability. They preferred computers for instrumental activities and mobile phones for social and entertainment purposes. Mostly, they preferred to use both devices, in concert. When pushed further and asked which they would choose if they could only keep one of them for a month, slightly more than half picked the mobile phone and slightly less than half picked the public access venue computer. Even when it was stipulated that the phone airtime would be free, there was little change, suggesting that cost is not as important a factor as the different affordances. In general, respondents were very reluctant to choose, implying that co-present and complementary use of both public access venue computers and private mobile is very important to them.

As long as access to computers and reliable home internet remains scarce, the public access venue will provide value to resource-constrained teenagers that cannot be replaced by mobile phone access alone. Even with wider home access, public access venues may continue to have unique value, as providers of safe and quiet workspaces as well as needed technical assistance. When public access venues help teens link to homework resources and to networks of interest, they may help shape dispositions toward learning and information activities that are linked to academic success.

MOBILE PHONES CAN ENHANCE THE IMPACT OF PUBLIC ACCESS VENUES

Public access operators can improve venue rules and skills training to encourage the complementary use of the mobile internet. The chief factor preventing more complementary use of mobile internet and shared access computers is the set of restrictions imposed in the typical venue. Overall, cybercafés and libraries have dramatically different approaches to rules about mobile phones. Nine of the 11 cybercafés interviewed had no rules in place about mobile phone use. Cybercafés in fact tend to welcome users' phones, providing help with application or email set-up (while charging a small fee for the help) and in many cases allowing users to connect their phone to a computer via USB cable or Bluetooth.

By contrast, six of the libraries completely banned mobile phones, eight required the phones to be silent, and four specified that phones were not to be connected to the computers. These restrictions are designed partly to avoid noise and distractions, but also to prevent virus infection. Additionally, the dominance of MXit among mobile uses leads libraries and telecenters to ban them as frivolous distractions.

The Non-Instrumental study asked users about their interest in having public access venues provide mobile-related services and found that these would generally be well-received (Figure 7.5). The practices of cybercafés suggest some ways in which libraries and telecenters could try to leverage synergies between public computers and private phones. Public access venues could provide valuable mobile-related services to users by introducing a combination of staff training, updated rules (to accommodate both the need for quiet and the need for data), improved antivirus software, a wi-fi connection (cost permitting), and perhaps some cabling and charging stations. Even with limited resources, public access

venues could orient to the mobile internet in a new way. A relatively modest investment in materials, time, and training would enable public access venue owners and frontline staff to accommodate mobile internet use as a complement to computer-based access.

Figure 7.5: How could public access venues foster synergies between PC and mobile phone use?
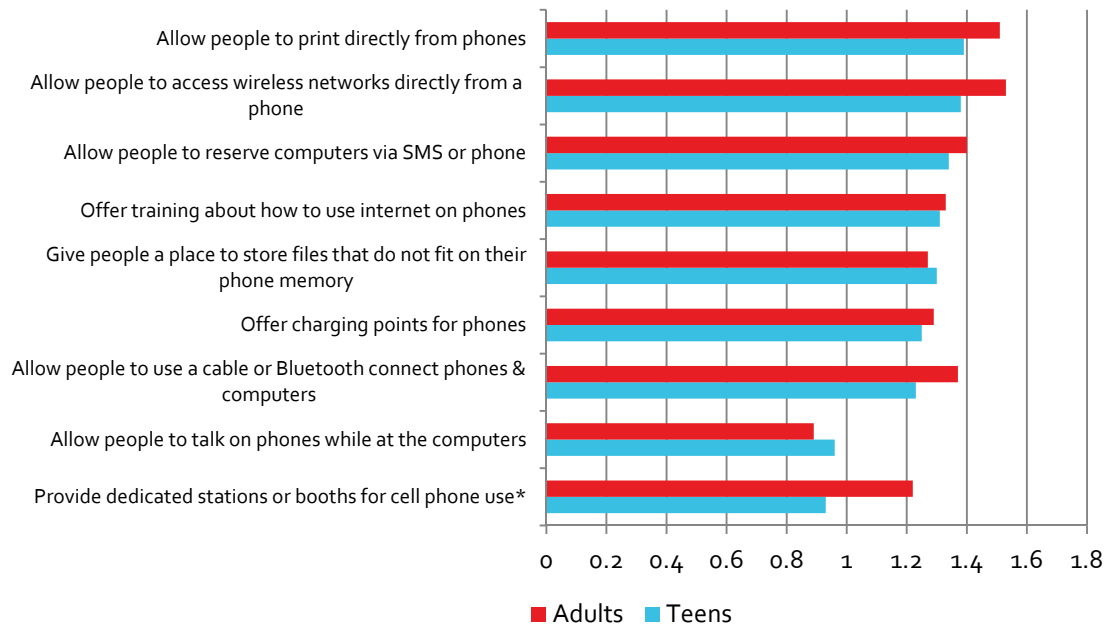
Notes: Data from Mobile Internet Study. Cybercafé N: (21-29), Teens N: (47-52). Means from a 0-2 scale (0 = Not interested, 1 = Somewhat interested, 2 = Very interested), and are intended to give a general sense of how these groups responded. Do not knows excluded.

Public or private: what is best?

Several of the in-depth studies found that a significant number of users have alternative means of ICT access besides public access venues, including home computers and internet connections and private mobile devices. Of the Non-Instrumental study respondents, 65% had home computers and 50% had internet access at home. Two-thirds of the Interpersonal study respondents had home access. The Mobile study found that 86% of venue users reported having accessed the internet on a mobile phone.

The in-depth studies thus confirm a key finding from the user survey: many public access venue users make use of public access venues for reasons other than lack of alternative access. The broad user survey identified the main reasons for such a choice, and the in-depth studies provide important evidence and narratives that complement these general findings.

The in-depth studies find that there is no fixed hierarchy of choice between private and public access. Either channel might be preferable for certain applications or activities or at specific times, or the two may be used in combination. Patterns of public and private access are far from exclusive. All five in-depth studies find ample evidence that users, particularly youth, have developed sophisticated, fine-grained practices as a kind of portfolio of private and public access, combining home computers, friends' or relatives' computers, mobile phones, and public access.

In many cases, the motivation for going to a public access venue is to access technically superior equipment or equipment that is not cost-effective to own (e.g., scanners, color printers). Getting help from venue staff is also important, including (as found in the Infomediaries study) when users may not wish to learn how to perform a specialized task they will seldom need to perform.

Finally, a critically important reason why users at times prefer public access venues is the search for socialization and learning around ICTs. Several in-depth studies suggest that these aspects are often connected: public access venue users want to be with other users in order to learn from one another. The Sharing study demonstrates that for a significant number of users, the primary motivation for using public access venues is being with others and sharing computers. The Non-Instrumental study demonstrates that social use and collaborative learning in public access venues is an effective way to promote computer skills and learning, particularly among young, poor, or less-educated users. The Mobile study shows that social connections through mobile devices, especially in connection with public access venue computer use, are important to the completion of schoolwork and to academic success.

Because this apparent social motivation is seldom explicitly acknowledged, few public access venues fully take it into account either in designing their physical environment or in organizing their service provision. The in-depth studies suggest that designing public access venues in a way that can accommodate collaborative use has important potential for impact.

Do venue rules matter to impact?

Public access venues implement a variety of restrictions on their users' activities, including limits on content which can be viewed or downloaded and bans on activities such as gaming, music listening, or social networking. These restricted activities may be viewed as detrimental to other venue users or to the venue's mission, or potentially damaging to equipment. Table 7.11 shows that, according to the venue survey, libraries impose the most restrictions, in all categories. Cybercafés impose greater limits than telecenters on content viewing (including pornography and offensive content), but are more permissive on gaming and social networking applications.

Table 7.11: Restrictive rules in public access venues (%)

	All	Libraries	Cybercafés	Telecenters	Other
Viewing pornography	66	93	66	48	81
Use filters to block offensive content	53	74	50	47	66
Downloading software	23	57	19	20	40
Downloading music/video	18	50	13	15	35
Gaming	12	33	8	16	19
Viewing other types of content	7	13	6	5	5
Other activities	6	8	7	1	7
Listening to music/video	6	19	3	8	11
Chatting using VOIP and/or IM	5	17	2	9	7
Using social networking applications	4	18	1	5	9

Note: n=1,235.Data from venue survey.

Venue administrators have differing opinions about the effect these restrictions have on user visits. Librarians tend to think their restrictions are attractive to users, as do cybercafé operators (to a lesser extent). Telecenters' operators believe that the restrictions discourage users from coming to their venue. Overall, however, 50% of venue administrators said that the restrictions have no impact on visitors, an opinion more prevalent among telecenter and cybercafé staff than library staff (Table 7.12).

Table 7.12: Venue operators' views on the effect of restrictions (%)

	All	Libraries	Cybercafés	Telecenters	Other
Attracts users	30	43	31	14	39
Discourages users	20	17	20	27	7
No Impact	50	40	49	59	54
Total	100	100	100	100	100

Note: n=946.Data from venue survey.

The in-depth studies identified some additional restrictions on user activities. The Infomediaries Study found that some Lithuanian public access venues have rules prohibiting collective use of computers to prevent sharing, and noted that young users object to them. The Mobile study highlighted limits imposed on the use of mobile phones in libraries. The in-depth studies also identified a category of practical constraints, such as limited hours of operations, or time limits on use of a work station when the venue was busy.

The benefits public access venues ostensibly receive from such restrictions must be weighed against their significant downsides. The implications of various restrictions were found in many areas:

- The Non-Instrumental Use study suggests that restrictions on non-instrumental use (particularly gaming and social networking) could negatively impact computer skills acquisition and learning.
- The Mobile study shows that use of mobile phones in public access venues, in tandem with computer use, has the potential to enhance users' ICT productivity and learning.
- The Infomediaries study notes that limitations on downloading programs or files can in some cases restrict users' ability to create content.
- Restrictions often shape practices: the 15-minute limit on computer use in busy South African libraries fosters quick-turnaround search-copy-paste-print homework routines rather than more thorough research.
- Infomediaries occasionally demonstrate empathy by treating the rules flexibly, for good reasons. They may adjust prices for low-income users, or they may extend hours of operations in certain circumstances (e.g., when exam results were posted online in Bangladesh, or, in Chile, when trainees needed weekend training sessions).

Summary

The findings of these five in-depth studies complement those of the surveys in multiple ways, to form a richly textured picture of uses and impacts of public access venues. Across the various studies, four core themes emerge.

1) Each of the five studies provides evidence that public access is not simply a transient substitute for private access, nor is it necessarily inferior to private access. Rather, public access and private access are often complements: people who have private access to computers and the internet also find important reasons to frequent public access venues. Whether public or private access is preferred for a given activity depends on multiple factors, ranging from timing and circumstances to the user's particular purpose. While some may prefer the privacy and immediate convenience of home access, others seek social interaction or assistance in public access venues. Such individual preferences may vary over time.

2) Second, all five studies describe complex, fine-grained practices developed by public access venue users to take advantage of the opportunities and affordances of various access options. Information technology users, at all levels of sophistication, understand the particular benefits and drawbacks of public access, and they have smart, adaptive strategies to use one or several access options in combination, individually or in concert with other users. The nuanced picture of public access that emerges from these accounts highlights the important place it holds in the user's access toolkit.

3) The in-depth studies all suggest that public access plays a critical role for the most vulnerable populations. They confirm the survey finding that many among the youngest, poorest, and most marginalized populations first encounter information technology at public access venues. These venues are the primary avenue through which they develop the skills to use computers and the internet and where they can get assistance in working toward digital literacy. For these users, the particular combination of opportunities offered by public access seems essential — including the availability of expert assistance or informal peer learning, the option to develop skills through alternative pathways

(that may include gaming and social networking), the ability to remain connected with distant family members, and the use of a quiet and safe place to do homework or other instrumental tasks.

4) The five in-depth studies show that public access opens multiple alternative pathways to digital literacy. Users repeatedly cited "learning" as a key reason why they frequent public access venues. What they have in mind, however, is not formal education or training in classes, but various informal ways of learning: by doing, by watching others, and by playing; or through communication with others or the mentorship of 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 represent a crucial laboratory for the discovery and development of non-traditional paths to digital literacy.

8. Benefits & Costs: How People Value Public Access Venues[33]

For the past century, researchers and public officials responsible for allocating public expenditures have sought a method to quantify the "value" of public access venues such as libraries and museums (Rea, 1916; Dana, 1920; Van House et al. 1987; Weech, 1998; and Smith, 1994). One method that has emerged in the past decade is benefit cost analysis (Holt & Elliot, 1998; Holt & Elliot, 2003; Aabo, 2005; Chung, 2008; Aabo, 2009).[34] Benefit cost analysis is a general method of putting disparate measures into like terms, usually monetary terms (Krutilla, 1967; Zerbe, 2007; among many). Benefit cost analysis is one lens used to inform policy makers, and does not replace alternative methods for evaluating proposed projects. Accordingly, this benefit cost analysis is intended to inform policy makers, not to substitute as a decision making tool.

This research is novel in three ways. First, it applies benefit cost methods in new research areas, including developing countries. Second, it contrasts findings across three types of public access venues. Third, this research is the first attempt to estimate both an upper and lower range of the benefits of public access for multiple venues in multiple countries, using mixed benefit costs methods.

This chapter addresses two questions:

1. What are the costs and benefits of public access to information and communication technologies?
2. How do those cost and benefits differ across countries, demographic characteristics, location of the public access venue, and public access venue type?

The geographic scope of this work includes Bangladesh, Brazil, Chile, Ghana, and the Philippines, examining three types of public access venues: cybercafés, libraries, and telecenters. Within each of these contexts the study analyzes how the independent variables of gender, location, and usage correlate with perceived benefits. The study found broad and statistically significant evidence of willingness to pay for public access to ICT, among both users and non-users.

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[33] This chapter is an abridged version of the Global Impact Study's benefit cost in-depth study report, "Perceptions of Value for Public Access to Information and Communication Technology in Five Countries: A Mixed Method Benefit-Cost Analysis Approach for Informing Policy." For this reason, it has a slightly different character than other chapters in this report.

[34] Benefit cost analysis does not differ substantively from cost benefit analysis except in placing the emphasis on the objective of public policy: maximizing public benefit.

Measures and methods

Benefit cost analysis assesses a specific good or service in terms of the expenditure it requires, the willingness to pay for it, and the benefit to the individual. The benefits of the good or service are estimated using two types of measures: revealed preference and stated preference.

Broadly, revealed preference measures are responses to the question, "what *have* you paid," while stated preference measures are responses to the question, "what *would* you pay." Researchers collect revealed preference measures either by observing choices or asking respondents what choices they have made in the past. A revealed preference measure might be an individual's direct expenditures on a good or service, or the costs an individual incurs to access a good or service. Stated preference measures, on the other hand, ask respondents to indicate what they would pay for a good or service. This study uses both stated and revealed preference measures, in four benefit cost analysis methods which are outlined here and described in more detail below.

1. *Analysis of benefits*

   a. **User**: revealed preference

   b. **Non-user**: stated preference

   c. **User and non-user**: stated preference (Chile case study)

2. *Analysis of costs*

   d. **Venue operator**: Stated expenditures

Users

For the analysis of the benefits accrued to users of public access, the study employed the travel cost method, a method of analysis for revealed preferences. The travel cost method is an aggregation of estimated non-market and market costs an individual incurs to access a good or service. Specifically, the study estimates the time and money an individual uses to travel to a venue that provides ICT. The time estimate is monetized as a function of income, and the travel costs are aggregated to estimate the total monetary costs. These two monetized estimates are summed, and then multiplied by the total number of trips to visit the venue per year. This method results in a minimum value that an individual is willing to spend annually to use public access venues. The estimate is a minimum, as users might have been willing to travel farther or to incur higher costs than they were observed to have incurred. Note that the travel cost measure does not include analysis of other, non-travel-related costs of using public access services.

The data for the travel cost method are drawn from the user survey. The user survey asked for travel distance, travel time, transportation costs, travel methods, and frequency of trips to public access venues. The benefit cost analysis framed three hypotheses for users: (1) that males will incur greater travel costs than females, (2) that rural users will incur greater travel costs than urban users, and (3) that users will incur greater travel costs to access libraries than cybercafés or telecenters. The survey also asked about demographic characteristics, such as age, gender, employment status, wage, and home access to the internet. Finally, country level information on minimum hourly wages was used to establish a reasonable baseline "cost of time," for individuals with missing or no income data.

The simplified model below yields total costs of travel, where T is the travel time, H is hourly wage, C is cost of transportation, and F is frequency of usage. As an estimate of the cost of time, 50% of the individual's hourly income is used. For individuals with no employment, including students, the travel cost of time as 50% of the minimum wage is set. Finally, all wages are converted to purchasing power parity (PPP) dollars to enable international comparisons.

$$Total\ Cost\ of\ Travel = ((T*50\%*H) + C) *F$$

The result is an estimate of the total costs of travel incurred by an individual to reach a public access venue. This measure gives a *minimum* value of public access, which may be contrasted with stated preference willingness to pay, as an upper bound of value.

Non-users

The second method analyzed non-users' stated preference for public access venues. Non-users were asked to state what they would be willing to pay to prevent the loss of existing public access venues. The value that non-users place on a public service is important for two reasons. First, in the study contexts, the characterization of non-users' perception of benefits can substitute for broad public opinion. Second, the values that non-users place on a good or service (often called a non-use value) is an important component of the total value to the community (Arrow et al. 1993, among many). These methods generally result in higher total valuations than revealed preferences, for two reasons. First, stated preference surveys are designed to estimate the full willingness to pay for the good, not the amount that an individual is actually charged. Second, because there are no costs incurred in stating a high willingness to pay, respondents may state a willingness to pay that exceeds their budget constraints. For these reasons, an open-ended stated preference question serves as a high estimate of total value of public access. Indeed, aggregating the benefits to non-users will often result in total benefits greater than the aggregation of the users — particularly when the number of non-users greatly exceeds the number of users.

Data for the non-users were drawn from the non-user survey, which asked individuals how much they would be willing to pay annually to prevent the closure of public access venues.

The benefit cost analysis framed two hypotheses for the non-users: (1) that males will state higher willingness to pay than females, and (2) that stated willingness to pay will be greater for libraries than for cybercafés or telecenters. Demographic data was collected to enable tests of hypotheses of independent variables that predict willingness to pay. Finally, all figures are converted to PPP dollars to enable cross-country comparisons.

In-depth study

The in-depth study of the Chilean public used the *contingent valuation method,* in a referendum format using a follow-up question. Contingent valuation is a stated preference survey method that asks respondents whether they would be willing to pay to prevent the loss of a good or service. In the referendum format, individuals are presented with a bid amount that they can either accept or reject. The follow-up question presents a higher amount if the respondent was willing to pay the first bid and a lower amount if they rejected it, allowing for greater accuracy in estimating stated preferences.

The survey presented a dichotomous choice: Would you be willing to pay [a bid amount] to prevent the reduction of hours of operation of a public access venue? (The percentage of reduction was randomly rotated between 25%, 33%, and 50%.) Following the initial response, the same question was asked with a

follow-up bid — roughly half the initial amount if they had declined and double if they had accepted paying the first bid amount. Total willingness to pay was estimated as a linear extrapolation of the percentage of reduction of hours: thus, willingness to pay to prevent loss of the entire venue was represented by doubling the stated willingness to pay to prevent a 50% reduction in the hours of service. Responses were solicited from a representative sample of 1,100 individuals using a random-digit telephone interview. To test hypotheses about predictors of willingness to pay, researchers asked respondents about their usage history of cybercafés, libraries, or telecenters, as well as their demographic characteristics.

This report uses the midpoint of the value range that is bounded by the bids amounts, then treats the valuation responses as continuous variables. This allows a testing of differences in responses for the independent variables of interest: gender, location, and usage history. The framing hypotheses are the same as for the non-user analysis: (1) that males will state higher willingness to pay than females, (2) that willingness to pay will be greater for libraries than for cybercafés or telecenters, and (3) that users will state higher willingness to pay than non-users. In the separate report on benefit cost, the data are modeled to show how additional independent variables predict willingness to pay (Davis, forthcoming).

Venue costs

Finally, the study attempted to compare the costs with the benefits of operating public access, for libraries, telecenters, and cybercafés, in both urban and rural areas. The sole source of data on costs was the venue survey, which asked venue operators two cost-related questions. First, they were asked to estimate line item costs, including rent, electricity bill, internet connection, and "other." Then they were asked to estimate the total cost of running the establishment. Unfortunately, the response rates were very low on both overall costs and itemized costs, yielding insufficient data to support generalizations. Therefore, in this report, cost data cannot be included to compare with benefits. (The existing results on cost data will be discussed in the full report on benefit cost analysis.)

Summary of findings

The analysis provided evidence that public access users incur annual travel costs ranging between $15 (Ghanaians, to cybercafés) and $83 (Brazilians, to cybercafés). This finding indicates the minimum annual benefit that accrues to users of public access venues, and has relevance for policy and program design (See note to Table 8.1).

In tests of preferences between venue types, the study found that, for Chile and the Philippines, where reliable travel cost information existed for libraries, **travel costs were highest for libraries — indicating high user valuation of benefits**. There were few statistically significant differences by gender, and minimal differences in travel costs between urban and rural settings. Within Bangladesh (the only country that had travel costs in both urban and rural areas), the study found higher travel costs for telecenters in urban than in rural areas.

The analysis of non-users revealed evidence of **widespread willingness to pay for** others **to have public access to ICTs**. The willingness to pay ranged from $2 (for libraries in Bangladesh) to $64 (for cybercafés in the Philippines). The differences in willingness to pay between libraries and cybercafés may reflect differences in degree of familiarity with different venue types. In Brazil and Chile, the highest willingness

to pay was for libraries; in Bangladesh, Ghana, and the Philippines, it was for cybercafés.[35] In contrast to users, there were significant gender differences in non-users' willingness to pay for different types of venue, suggesting that men and women value venues differently.

As the first multi-country study of willingness to pay for public access, these findings should inform policy makers' assessment of the value of public access venues, to take into account the benefits perceived even by individuals that do not themselves use the venues. ***The public at large recognizes the value of public access venues and favors their provision***.

Similarly, the in-depth study of the benefits of public access venues in Chile found overwhelming support for public access venues. The mean individual willingness to pay to keep *all* three types of venues open was $60. Among the responses for individual venue types, support for libraries was highest, with a mean of $49 to keep libraries open. The study found moderate support for telecenters, with willingness to pay of $17, and the lowest support for cybercafés, with a willingness to pay of $7. Women were willing to pay more, for all venues. There were no significant differences in willingness to pay between respondents within Santiago and those outside the capital city. ***The public evidently prefers libraries as public access venues over telecenters and cybercafés***.

Table 8.1 represents a summary of findings from the user, non-user, and in-depth research. Estimates of the non-users represent a high estimate (overestimate) of perceived benefits for the general public; estimates for users represent the minimum annual benefit for users; and the in-depth study results include both users and non-users.

Note that these findings are a simplification, representing extrapolations from the data that were collected and analyzed. The estimates in all the tables in this section represent midpoints of *ranges*, rather than point estimates. The findings are moreover subject to all the caveats discussed in the findings.

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[35] Analysis also showed that respondents were internally consistent and rational; willingness to pay for all venues was always greater than for any one venue

Table 8.1: Summary of user and non-user estimates of public value per person (PPP dollars)

	Estimate type	Cybercafés		Libraries		Telecenters		All Venues	
		Male	Female	Male	Female	Male	Female	Male	Female
Bangladesh	Non-users: Stated WTP	$7.09	$5.90	$2.31	$1.60	$6.57	$5.83	$11.11	$7.65
	Users: Travel Cost	$36.88	$47.83	$15.51	$35.19	$39.51	$36.21		
Brazil	Non-users: Stated WTP	$12.03	$9.53	$13.73	12.02	$12.82	$10.36	$40.20	$26.23
	Users: Travel Cost	$80.24	$84.91	$13.56	NA	$31.58	$30.94		
Chile	Non-users: Stated WTP	$10.58	$12.42	$13.21	$14.66	$12.44	$12.42	$12.79	$20.10
	Users: Travel Cost	$33.31	$32.15	$43.02	$43.80	$29.03	$40.02		
	In-Depth: WTP	$6.75	$7.54	$47.35	$50.50	$15.92	$17.91	$55.79	$64.16
Ghana	Non-users: Stated WTP	$17.45	$8.89	$12.88	$9.74	$14.51	$6.81	$27.42	$16.68
	Users: Travel Cost	$15.01	$15.97	$13.33	$1.40	$65.62	$18.23		
Philippines	Non-users: Stated WTP	$66.58	$61.86	$46.83	$55.08	$42.64	$41.95	$115.90	$86.84
	Users: Travel Cost	$34.96	$32.94	$42.14	$55.78	$32.29	$12.63		

Table 8.1 can be illustrated with an example. A policy maker in a community in Bangladesh could estimate the benefits of providing a public access venue using the data from this report, as follows:

For a population of 100, including 45 male non-users and 45 female non-users, the non-user public value of a public access cybercafé would be (45 x $7.09) + (45 x $5.90) = $583.20, as an upper bound.
In the same community, for 5 male users of cybercafés and 5 female users of cybercafés, the minimum annual value for a public access cybercafé would be (5 x $36.88) + (5 x $47.83) = $423.55, as an annual minimum value.

Users: Benefits of access

The analysis of benefits sought to accomplish two tasks: first, to estimate the annual expenditures of users on public access venues; and second, to test the hypotheses that the independent variables of venue type, gender, and location influence the annual expenditures of users on public access venues.

Annual expenditures were found ranging from a high of $83 for Brazilian users of cybercafés, to a low of $15 for Ghanaian users of cybercafés. These expenditures establish a minimum annual value for users of each venue. Table 8.2 shows the mean annual travel cost as reported by respondents that use each of the public access venues, for each country, in purchasing power parity dollars.

Table 8.2: Mean reported annual travel cost in PPP dollars, by country

	Cybercafés	Libraries	Telecenters
Bangladesh	$38.60	$23.71	$38.50
Brazil	$82.69	$13.56	$31.18
Chile	$32.75	$43.45	$35.85
Ghana	$15.24	$7.37	$41.92
Philippines	$34.30	$49.18	$23.04

Note: Shaded cells have a sample size of fewer than 29 observations, and therefore the findings are less generalizable

The most surprising finding shown in Table 8.2 is that travel costs are roughly equal for the three types of venue, in the countries for which consistent data exists — Bangladesh, Chile, and the Philippines (excluding the shaded items, with too few observations). There was a slightly higher cost incurred by users of libraries as compared to cybercafés, in both Chile and the Philippines, though these differences were not statistically significant due to small sample size and high variance in the data. If these patterns are borne out in further research, however, ***this finding suggests that users in Chile and the Philippines are willing to spend more to reach a library than a cybercafé***.

Cybercafé users in Brazil incur the greatest travel costs of any venue for any country, whether because of a strong preference for cybercafés or because of lack of alternatives. In fact, the majority of public access venues in Brazil are cybercafés or other independent, stand-alone facilities (see Chapter 3). ***Given limited options, Brazilians are incurring the greatest travel costs to access public access venues***.

Table 8.3 is a summary table of the travel costs incurred by urban and rural users in Bangladesh — the only country with data on travel costs in rural areas. The costs of accessing cybercafés is the same for rural and urban users, but ***urban users in Bangladesh pay more than double the rural cost for accessing telecenters***. (With sample sizes of 255 and 152, these two costs are statistically different at the p <.001 level.) These findings imply that either urban users in Bangladesh strongly prefer telecenters to cybercafés, or telecenters are more abundant and therefore more frequently used than cybercafés.

Table 8.3: Mean travel costs by location (Bangladesh)

	Cybercafés	Libraries	Telecenters
Bangladesh, Rural	$37.38	$21.62	$27.16*
Bangladesh, Urban	$39.09	$26.63	$57.53*

Note: Shaded cells have a sample size of less than 29 observations, and therefore the findings are less generalizable
* P < .0001

In contradiction of the framing hypothesis regarding gender distinctions, the study found no significant differences by gender in the cost of travel to access any venue, in any country. Table 8.4 shows the mean travel costs incurred by men and women for each venue type and for each country. ***For users of public access venues, no gender difference in the travel costs was found***.

Table 8.4: Mean travel costs by gender

	Cybercafés		Libraries		Telecenters	
	Male	Female	Male	Female	Male	Female
Bangladesh	$36.88	$47.83	$15.51	$35.19	$39.51	$36.21
Brazil	$80.24	$84.91	$13.56	-	$31.58	$30.94
Chile	$33.31	$32.15	$43.02	$43.80	$29.03	$40.02
Ghana	$15.01	$15.97	$13.33	$1.40	$65.62	$18.23
Philippines	$34.96	$32.94	$42.14	$55.78	$32.29	$12.63

Note: Shaded cells have a sample size of less than 29 observations, and therefore the findings are less generalizable

The travel cost analysis represents a first effort to quantify the travel costs incurred by users in different settings, for three types of venue. The study was able to test hypotheses on differences in travel cost by venue type, gender, and location. *These findings establish a minimum public value for users of the public access venues*. The summary tables above can serve as tools for policymakers, to understand the tradeoffs involved in providing (or subsidizing) public access venues.

Non-users: Willingness to pay to maintain access

Are non-users willing to pay for public access, and is there an association with either type of venue or gender of respondent? The analysis shows unambiguous evidence of widespread willingness to pay on the part of the non-user population, to keep public access venues open for the general public. Willingness to pay ranged from a high of $101.30 in the Philippines, for all venues, to a low of $2.02 in Bangladesh, for libraries. Responses were internally consistent, showing willingness to pay more to keep all venues open than to keep a single venue open. These findings provide strong evidence of wide perception of the benefit of public access ICTs, and should inform policy makers' assessment of the importance of providing public access facilities. These findings are particularly important because they come from the population of non-users. In many countries, the non-user population is in the vast majority, and the

values they express can serve as a proxy for the nation's population as a whole. (Note, however, that the sample for the non-user survey was limited to people living near a public access venue, and therefore does not fully capture the characteristics of the national population of non-users.)

Table 8.5 is a summary of non-users' stated willingness to pay, by venue type and by country, showing the mean amount that respondents were willing to pay, as well as the standard deviation and the number of observations. For Brazil, for example, Table 8.5 shows data on 299 non-users, whose average willingness to pay to prevent the closure of all three types of public access venue was $33.38. Every value is significantly different from zero (p < .05).

These values represent a high estimate of the perceived public value of public access venues, since these are not actual costs incurred but a stated willingness to pay. The previous section, on users, provided actual cost figures that tend to understate willingness to pay (since users might be willing to pay more than the current actual costs). Together, the two measures provide a range of the estimated value of public access. These two measures are not a perfect match, however; the estimates for users are an annual measure, while the stated willingness to pay from non-users is a one-time stated preference.

Table 8.5: Non-user willingness to pay, by country and type of venue

	Indicator*	Cybercafés	Libraries	Telecenters	All Venues
Bangladesh	**mean**	$6.59	$2.02	$6.24	$9.34
	s.d.	17.45	5.138	12.09	23.02
	n	173	191	192	345
Brazil	**mean**	$10.83	$12.89	$11.56	$33.38
	s.d.	10.10	11.89	10.81	52.98
	n	123	132	127	299
Chile	**mean**	$11.78	$14.15	$12.43	$17.34
	s.d.	28.27	27.79	27.87	54.51
	n	175	174	173	357
Ghana	**mean**	$13.23	$11.32	$10.93	$21.75
	s.d.	23.19	17.80	26.49	44.83
	n	142	145	127	286
Philippines	**mean**	$64.14	$51.10	$42.28	$101.30
	s.d.	225.10	150.50	132	367.20
	n	176	176	176	400

Note: * Statistical indicators are: mean, standard deviation (s.d), and number of observations (n)

Respondents' willingness to pay differed by venue, indicating their understanding of the differences between the venue types as well as the types of services offered in each venue. The internal value ranking of venue type could be at least partially explained by differences in respondents' familiarity with the venues. In Bangladesh and the Philippines, with relatively few libraries and plenty of cybercafés, stated willingness to pay for cybercafés was much higher than for libraries.

The study also found statistically significant gender differences in willingness to pay for cybercafés and telecenters in Brazil and Ghana. In each of those cases, men stated a higher willingness to pay than women. And for Bangladesh, Brazil, and Ghana, men were willing to pay more for *all* venues than women were. However, ***there was no statistically significant gender difference in any country in willingness to pay for libraries***. Table 8.6 summarizes the findings.

Table 8.6: Non-user willingness to pay, by gender and country

	Cybercafés		Libraries		Telecenters		All Venues	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Bangladesh	$7.09	$5.90	$2.31	$1.60	$6.57	$5.83	$11.11*	$7.65*
Brazil	$12.03*	$9.53*	$13.73	$12.02	$12.82*	$10.36*	$40.20**	$26.23**
Chile	$10.58	$12.42	$13.21	$14.66	$12.44	$12.42	$12.79	$20.10
Ghana	$17.45**	$8.89**	$12.88	$9.74	$14.51*	$6.81*	$27.42**	$16.68**
Philippines	$66.58	$61.86	$46.83	$55.08	$42.64	$41.95	$115.90	$86.84

Note: * $P < .1$. ** $P < .05$.

Libraries

For the surveyed countries with greater per capita income, libraries ranked above other venues in non-user willingness to pay. In Brazil and Chile, non-users valued libraries higher than cybercafés and telecenters — the reverse of the pattern in Bangladesh, Ghana, and the Philippines. One reason for this might be that public services, including public libraries, are better in wealthier countries, and therefore individuals value them more highly. In less wealthy countries, on the other hand, libraries are relatively scarce and therefore less familiar to non-users. Here, the private sector provides public access in the form of cybercafés, and greater familiarity with these services results in a higher public valuation.

Table 8.7: Gross domestic product (GDP) per capita

	2007	2008	2009	2010	2011	Average 2007-2011
Bangladesh	$475	$547	$608	$675	$735	$608
Brazil	$7,197	$8,629	$8,392	$10,993	$12,594	$9,561
Chile	$10,406	$10,695	$10,179	$12,640	$14,394	$11,662
Ghana	$1,085	$1,226	$1,090	$1,319	$1,570	$1,258
Philippines	$1,685	$1,925	$1,836	$2,140	$2,370	$1,991

Source: World Bank: http://data.worldbank.org/indicator/NY.GDP.PCAP.CD

Another characteristic shared by Brazil and Chile, as higher-income countries, is that a high percentage of the total population uses the internet. Chilean internet usage in 2009 was estimated at 41%, and in Brazil at 38%. One hypothesis is that in a society that is broadly familiar with ICT services, individuals value public access highly even if they do not use the venues themselves.

Table 8.8: Population, internet users, and percentage of the population online (2009)

	Population	Internet Users	Users (%)
Bangladesh	161,083,804	617,300	0.4%
Brazil	199,321,413	75,982,000	38%
Chile	17,067,369	7,009,000	41%
Ghana	24,652,402	1,297,000	5%
Philippines	103,775,002	8,278,000	8%

Source: Population and internet usage statistics from the CIA World Factbook. Accessed Sept. 2012: https://www.cia.gov/library/publications/the-world-factbook/rankorder/2153rank.html

Libraries in Bangladesh were the by far the least valued public access venue, with a stated willingness to pay of just $2.02 PPP. The low valuation may reflect a general lack of familiarity with the services that a library provides: Bangladesh had an internet usage rate of only 0.4% in 2009. The low willingness to pay for library services in this case indicates the internal validity of the survey: ***where publicly provided services are relatively unknown, they ranked lower than privately operated services in willingness to pay***.

Cybercafés

In countries with low per capita income, non-users assign greater value to cybercafés than to other public access venues. If per capita GDP is used as a predictor of the level of provision of social services, such as public libraries, a working hypothesis would be that lower income countries tend to value cybercafés over public libraries in part because of lack of familiarity with libraries. These data also suggest the need for research on the provision of public (social) services more generally, investigating the relationships among

the revenue model, the level of service provision, and the public's stated willingness to pay for public services. For example, where paying for social services is not a norm, it may be that users assign low valuation because they reject the payment vehicle as opposed to rejecting the provision of the service.

Summary of non-user survey findings

The non-user data provided valuable insights on the creation of public value through public access venues. Non-users understood that public access was valuable, they understood the differences between venue types, and they reported willingness to pay to prevent the loss of the public value. In countries with higher per capita income and more widespread internet usage, libraries were valued more highly than cybercafés and telecenters. In countries with low per capita income and low internet usage, cybercafés were valued more highly than libraries. Finally, with the exception of Chile, male non-users expressed greater willingness to pay for the provision of public access venues.

In-depth study: Chile

The Chilean in-depth study focused solely on capturing the perceived benefits of public access, testing a set of distinctions across venue types and user groups. The factors examined as potentially affecting willingness to pay for public access venues included: venue type; location (rural or urban); and user's gender and usage history. With a sample of 1,100 respondents, including both users and non-users, the study found statistically significant differences in the willingness to pay by venue type as well as specific differences by gender and usage history. The data showed no significant differences in willingness to pay by location.

On average, respondents were willing to pay $7.14 to prevent the reduction of hours of cybercafés, $16.92 for telecenters, $48.93 for libraries, and $59.99 for all venues (all results significantly different from zero willingness to pay, Table 8.9). Moreover, the responses were internally consistent in assessing the value of all three venues as greater than any single one.

The results indicate that:

- The Chilean public understands the differences between venue types and places different value on different venue types.

- Chileans are willing to pay more to prevent the closure of libraries than telecenters, and more for telecenters than cybercafés.

Table 8.9: Venue valuations overall, Chile (USD)

	Cybercafés	Libraries	Telecenters	All Venues
mean	$7.14**	$48.93**	$16.92**	$59.99**
s.d.	18.57	52.63	26.48	72.19
n	1,104	1,104	1,104	1,104

Note: * Statistical indicators are: mean, standard deviation (s.d.), and number of observations (n). ** P < .001.

The study found no support for the hypothesis that gender affects the perceived benefits of different types of public access venues: there was no statistical difference between the valuation of men and women for cybercafés, libraries, or telecenters. However, women placed a greater value than men on all three venues together (Table 8.10), stating that they would be willing to pay $64.16 to prevent the reduction of all services, whereas men stated that they would be willing to pay $55.79.

Table 8.10: Venue valuations, by gender, Chile (USD)

	Indicator	Cybercafés	Libraries	Telecenters	All Venues
Female	**mean**	$7.54	$50.50	$17.91	$64.16**
	s.d.	17.05	54.86	26.12	79.38
	n	554	554	554	554
Male	**mean**	$6.75	$47.35	$15.92	$55.79**
	s.d.	20.00	50.29	26.82	63.93
	n	550	550	550	550

Note: * Statistical indicators are: mean, standard deviation (s.d.), and number of observations (n). ** $P < .05$.

The hypothesis regarding location was that that rural users would place a higher value on public access than urban users. To test this hypothesis, the results for Chile's capital city of Santiago were compared with results from areas outside the city. There was no significant difference between the two locations in the valuation of cybercafés, libraries, telecenters, or all three venues (Table 8.11). This rather surprising finding may reflect the particular population distribution of Chile. In a country of 17 million people, more than 10 million live in the capital city or the surrounding metropolitan area. Furthermore, 89% of the population is urbanized, making it difficult to test for differences by location. (Population statistics for 2010 are found in https://www.cia.gov/library/publications/the-world-factbook/geos/ci.html).

Table 8.11: Value by location, Chile (USD)

	Indicator*	Cybercafés	Libraries	Telecenters	All Venues
Outside Santiago	**mean**	$7.18	$47.38	$16.78	$57.86
	s.d.	19.05	54.70	25.80	73.43
	n	666	666	666	666
Santiago	**mean**	$7.08	$51.28	$17.14	$63.23
	s.d.	17.85	49.29	27.50	70.21
	n	438	438	438	438

Note: * Statistical indicators are: mean, standard deviation (s.d.), and number of observations (n)

The study also compared the responses of users and non-users of public access venues in three ways:

1. A comparison of the willingness to pay of users vs. non-users of public access venues.
2. A comparison of the value users placed *on the type of venue they used* vs. the value that others (users and non-users) placed on that venue.
3. A comparison of the value users placed on the venue they used, *for users who only used one type of venue,* vs. the value that users of *other* venues placed on that type of venue. (For example, the value that library-only users placed on libraries was compared to the value placed on libraries by people who only used cybercafés or telecenters.)

The first test showed no statistical difference between the valuations of users and non-users for cybercafés and telecenters (Table 8.12). However, users of *any* public access venue valued libraries (as well as all venues) more highly than did non-users. In other words, users of public access venues differ from non-users only when valuing libraries (and all venues combined), not when valuing cybercafés or telecenters. Moreover, the values assigned by all respondents to libraries were much higher than those for the two other venues.

Table 8.12: Users of no venues contrasted with users of any venue, Chile (USD)

	Indicator*	Cybercafés	Libraries	Telecenters	All Venues
Non-users	**mean**	$6.71	$42.65***	$15.99	$52.44**
	s.d.	17.90	50.38	26.61	70.56
	n	470	470	470	470
Users	**mean**	$7.47	$53.58***	$17.61	$65.59**
	s.d.	19.07	53.81	26.38	72.92
	n	634	634	634	634

Note: * Statistical indicators are: mean, standard deviation (s.d.), and number of observations (n). ** P <.01. *** P<.0001.

Second, the study compared the value a user placed on the venue they used vs. the value that *all others* (users of public access venues and non-users) placed on that venue (Table 8.13). People who reported using cybercafés valued cybercafés at $8.21, while people who did not use cybercafés valued them at $6.39, suggesting that users of cybercafés are willing to pay more for them than non-users of cybercafés; similar results are shown for libraries. Finally, the results show that ***people that use any venue are more willing to pay for* all *venues than people that use no public access at all***. Users of any public access venue were willing to pay $65.59, whereas non-users were willing to pay $52.44. This finding shows that ***both users and non-users are willing to pay for access***, though at different levels, and that even non-users perceive differences between venues.

Table 8.13: Differences in valuation of users and non-users of the venue they are valuing, Chile (USD)

	Indicator*	Cybercafés	Libraries	Telecenters	All Venues
Non-users	**mean**	$6.39**	$46.55***	$16.90	$52.44****
	s.d.	15.87	51.55	26.22	70.56
	n	647	709	1,059	470
Users	**mean**	$8.21**	$53.20***	$17.43	$65.59****
	s.d.	21.81	54.33	32.33	72.92
	n	457	395	45	634

Note: * Statistical indicators are: mean, standard deviation (s.d.), and number of observations (n). ** P <.10. *** P<.05. **** P<.01.

The third test compares the value that individuals who only used one type of venue placed on that venue type vs. the value placed on that venue type by individuals who only used other types of venue. The results showed that cybercafés were valued more highly by the exclusive users of cybercafés, at $9.82, than by the users of libraries and telecenters, at $5.40 (Table 8.14). Interestingly, however, the valuation of libraries by exclusive users of libraries did not differ from the valuation of libraries by exclusive users of cybercafés or telecenters. This finding suggests that ***public access users who do not use libraries still appreciate the value of public access services in libraries, and are willing to pay to continue the provision of this service***.

Table 8.14: Valuation by users of that venue contrasted with users of other venues, Chile (USD)

	Indicator*	Cybercafés	Libraries	Telecenters
Only use this venue	**mean**	$9.82**	$49.75	$22.43
	s.d.	24.96	53.74	21.98
	n	228	168	5
Only use other venues	**mean**	$5.40**	$52.78	$17.58
	s.d.	8.03	53.88	26.50
	n	213	273	623

Note: Shaded cells have a sample size of less than 29 observations, and therefore the findings are less generalizable. * Statistical indicators are: mean, standard deviation (s.d.), and number of observations (n). ** P <.01.

In conclusion, the in-depth study tested differences in stated willingness to pay by gender, usage history, location, and venue type. ***The larger sample size of 1,100 respondents yields a conclusion that public access has widespread support, across venues as well as by users and non-users. Moreover, the consistently higher willingness to pay for libraries indicates a public preference for libraries over other venue types***. This preference holds when controlling for gender, location, and usage history.

Venue costs/expenditures

In the benefit-cost study, efforts to estimate the costs of providing services were largely unsuccessful. First, the response rate was very low — especially for libraries, rural venues, and telecenters (outside of Bangladesh). Second, the survey showed little internal consistency: the sum of the line item estimates rarely agreed with the estimated total costs. Finally, the reported itemized costs were sparse; a venue might report internet costs but not staff costs. For this reason, the research team chose not to include a table of benefit cost ratios.

The most important finding from the effort to estimate costs is a methodological observation. Large sample survey methods are inappropriate for complex accounting questions such as itemized costs, which are difficult for respondents to answer. A more promising approach would **survey smaller samples of representative venues, using in-depth methods** that are designed to build trust, and would work closely with respondents to ensure that they understand and can answer accounting questions.

Summary

What are the costs and benefits of public access to ICTs, and how do those differ by venue, gender, location, and usage history? By using mixed methods, the study was able to estimate benefit levels, establishing minimum values (actual costs reported by users) and maximum values (willingness to pay, as reported by non-users). Contrasting public benefits with costs was not possible, as data on the cost of operating venues were inadequate.

The study resulted in four broad findings. First, it found broad and statistically significant willingness to pay for public access to ICTs, *among both users and non-users*. Even non-users recognized the public value created by ensuring public access to information and communication technologies. Second, the study found that both users and non-users perceive differences in the value of the three types of public access venues. The Chile in-depth study found much higher valuations for libraries over telecenters or cybercafés, for both users and non-users. Third, the study found few differences in willingness to pay by gender: men and women evaluated the importance of public access venues equally. Finally, there were limited differences in valuation of public access venues across urban and rural contexts.

As with all benefit cost analysis, this research is best used as an informative tool, not as a substitute for other valuation methods or a decision-making formula. The generalizability of the findings is in all cases limited by sample size, estimation error, and methodological limitations. This research, along with other findings in this report, provides an informative tool for policy makers in weighing the costs and benefits of (for example) providing libraries, or promoting alternative forms of public access to information and communication technologies.

9. Public Access in a Development Context

An early understanding of the ICT landscape viewed public access as merely an intermediate step on the road to private access. The findings reported here support a more nuanced understanding. Public ICT access can be understood both as a (sometimes temporary) substitute for private access, but also as a (potentially permanent) complement to private access, as documented in this report.

Public access encompasses a wide variety of venues in many countries. A significant body of research has examined a range of specific issues surrounding *public access venues*, including:

- the transitory nature of many privately operated venues, alongside reported spikes in the number of such businesses
- the sustainability challenges of government- or donor-funded public access venues
- the lack of appropriate models for rural settings, which face special infrastructure problems
- different patterns of actual use, such as inequitable participation of women or girls
- whether these venues are delivering any meaningful benefits to the target communities

This chapter reviews the main findings of the five years of research conducted by the Global Impact Study team, and offers some thoughts on the implications of these findings for the broader socioeconomic development agenda.

Throughout its lifespan, 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. The Global Impact Study however generally also favors 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.

Overview of findings

The Global Impact Study addresses three broad research goals: to identify the impacts of public access to ICTs; to assess the magnitude of those impacts; and to investigate the relationship between the costs and benefits of public access ICTs. The study was especially interested in identifying trends that cut across multiple contexts (e.g., countries and venue types), to point to conclusions about public access as a global phenomenon. The research included eight countries and multiple research treatments.

The research model identified six factors relevant for gauging the impacts of public access: (1) geographic and social reach; (2) patterns of use; (3) location and design of public access venues; (4) details of operation and services provided by venues; (5) the specific information ecology context; and (6) the policy environment.

What are the impacts of public access to information and communication technologies?

Public access has both first-order and second-order effects. It is generally recognized that computer and internet technologies are crucial resources for functioning in today's society. It is assumed, then, that populations that do not have access to ICTs are disadvantaged in the global economy. The question addressed in this research concerns the specific impacts of the public access model of delivering ICTs. The first-order effects of public access lie in enabling target populations to overcome the limitations that hamper their ability to access and make productive use of ICTs (e.g., poverty or lack of appropriate skills). In other words, *digital inclusion* is the fundamental first-order effect of public access provision.

The research identifies three levels of this type of inclusion: technology access, information access, and the development of ICT skills. *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, lack of alternative forms of access to ICTs tops the list of users' reasons for patronizing public access venues. For many users and former users, this is where they had their first encounter with computers and the internet.

Information access flows from technology access, as computers and the internet are gateways to a wealth of information on different issues. Study data show that users take advantage of both the technological and the human intermediary resources at public access venues to access information that would otherwise not be directly available to them.

A critical impact of public access is its role in facilitating *the development of ICT skills* (defined narrowly in terms of development of general computer and internet skills). 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. Public access users consistently acknowledge the contribution of venues in the development of their computer and internet skills.

Beyond digital inclusion, public access has other outcomes — here considered second-order effects — 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 was included that is clearly a priority for users, based on reported usage patterns: Communications & Leisure. From the perspective of users, public access delivers benefits that touch on all these aspects of their lives. In every domain it is clear that, to differing degrees, the availability of public access enables users to engage — to participate in those aspects of personal, social, economic, and civic life that are important to them.

These impacts are not limited to those who depend on public access for ICTs. Former users, non-users, and people who have alternatives to public access also report benefits. Former users indicated that public access was important to them in the past, setting them up (the study suggests) for participation in the information society. Those who have other means of accessing ICTs (at home or work) find compelling reasons to visit public access venues when they need better equipment or other resources. Non-users report indirect benefits, through the use of public access by their family and friends. Although direct access is shown to deliver more impacts, these indirect uses and outcomes are often substantial.

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

Public access enables development in personal, social, economic, and other areas of life by providing the technological and human tools that allow people to participate in the information society. Public access supports the development of knowledge and skills (at many levels) to navigate the digital world — and through that also the real world. Public access provides users with benefits in a variety of ways: supporting communication and social interaction; supporting information-seeking on diverse topics; supporting service-seeking in multiple areas of the economy; improving efficiency and reducing transaction costs to get things done; and supporting the pursuit of *leisure activities*. Public access is not a monolithic force.

What is the magnitude of public access impacts?

How big or small are public access impacts, and how can they be measured? The Global Impact Study measured the magnitude of a particular impact by the percentage of respondents reporting — as positive, negative, or non-existent. This seemed more feasible than trying to measure the change in a particular area of a particular person's life as a result of using public access. As defined by this study, the magnitude of public access impacts varies substantially depending on the population and the domain involved.

Public access impacts were not assessed in terms of scale — as either big or small — but rather as either broad-based and cross-cutting or targeted. In some areas, public access impacts were quite expansive, spanning young and old populations, urban and non-urban, male and female, employed and unemployed, and so on. This tended to be the case in areas related to the Education and Communications & Leisure domains, where over 80% of users and over 50% of non-users indicated positive impact from their own use or their family and friends' use of public access. In the other four domains — Culture & Language, Employment & Income, Governance, and Health — public access impacts were more narrowly focused on specific populations, and for these populations the impacts were also overwhelmingly positive.

Looking more closely at some specific goals that users pursue at public access venues, the study found very high reported levels of goal achievement, indicating 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 factors may include the level of users' motivation and personal abilities; moreover, users' reports that they have achieved specific goals may or may not be justified. Setting aside these considerations that fall outside the scope of analysis in the study, it is clear that public access users gain access to the tools they need in order to attempt, and often to complete, specific computer or internet-related tasks

The study also compared users' and non-users' perceptions of positive impacts from public access usage, and further compared these impacts to the reported impact of alternative channels for information and communication. The results suggest that having *direct* access to ICTs and related resources makes a difference: the highest percentage of positive ratings of public access came from public access users. Non-users experienced some positive indirect impacts as well, though not as much as from their other information and communication resources. There is no judgment implied about the quality of the different resources (public access versus radio or television, for example), although this could make for interesting further investigation.

What is the relationship between the costs and benefits of providing and using public access ICTs?

A relatively unexplored area of public access is the relationship between the costs and benefits of providing public access. The research was designed to illuminate this topic from the perspective of both service providers and service users. However, it was difficult to collect adequate cost data from public access venues, so the reported results relate only to the users' perspective on the costs and benefits of public access. The travel cost method provides an expression of the value users place on public access by asking how much they pay annually, or are willing to pay, to reach a public access venue. In purchasing power parity terms, this amount ranged from $15 in Ghana to $83 in Brazil. The data also show that any form of access is worth an expenditure: where users do not have a variety of options, they are prepared to pay to get to whatever is available. However, in Chile and the Philippines, libraries appear to be more highly valued than other venue types, as users were willing to pay more to reach a library than a cybercafé. In a separate study in Chile, this finding was confirmed. Both users and non-users indicated willingness to pay about $49 to keep libraries open, compared to $16 for telecenters and $7 for cybercafés (all annual, in purchasing power parity).

Would non-users of public access be willing to pay for public access to be available to people other than themselves? A positive finding would be an important indicator of the social value of public access. The results point to the extensive reach of public access: non-users in the five survey countries indicated a willingness to pay ranging from $2 (Bangladesh) to $101 (Philippines) to keep public access venues open.

In summary, the populations of both users and non-users appear to recognize the value of public access and are willing to pay — either to access such venues themselves or to ensure the continued availability of public access venues of all types.

Contextualizing public access impacts

The following discussion covers broader questions about public ICT access, from a policy perspective: whether it remains relevant, whether it substitutes for private access, how is it used by priority populations in priority domains, whether venue type matters, and how to measure public access impacts.

1.   Is public access still relevant?

The evidence is clear and unambiguous: public access venues play a critical role in extending the benefits of ICTs to large swaths of the population. Using multiple lenses, the study found that the impacts are significant. Public access venues constitute the only option for many, the place where a majority of users had their first contact with computers and the internet and learned ICT skills, and an important resource for information that they cannot find elsewhere. Users experience positive impacts across a wide range of areas. They also seek information and perform services on behalf of others, as confirmed by both users and non-users. People's use of the internet would decline if public access were to disappear, and even among those who have alternative (i.e., private) access, public access venues are a valuable resource. The study also found that public access was important to ex-users, indicating a formative role in introducing new users to computers and the internet. That non-users expressed a willingness to pay to keep public access facilities open further supports the conclusion that the public values these institutions and services in their communities.

The rise of mobile telephony only reinforces this picture. Mobile phones are not a substitute for ICT access. While they have become a critical resource in the repertoire of information and communication

resources, this form of private access does not appear to lessen the importance of public access venues. Indeed, a great majority of public access users do possess mobile phones. Even youth who own mobile internet devices (a rapidly growing demographic) use, and value, the affordances provided by public access venues.

A feature of public access that cannot be duplicated by mobile access is the physicality of the place. A major driver of public access use is the desire to be with others — not just for social reasons, but also to learn skills and to glean information resources from others. This important function seems to go largely unnoticed in the development community, but it warrants serious consideration. Hubs that serve as gathering places can play an important role in the social life of a community.

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 countries surveyed with lower connectivity) are especially reliant on staff assistance. Their use of ICTs would decline more precipitously, in the absence of public access venues, than that of users in the other surveyed countries. However, public access is equally important in higher connectivity countries — particularly for ensuring that all residents, especially more marginalized groups, can access the skills and resources to join the information society.

Finally, public access is 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. While public access has lost its appeal for experts in many development circles, its staying power and lasting significance for broad sectors of the public — in all countries — cannot be underestimated.

2. Is public access to ICTs a substitute or a complement to home access?

Western countries, which experienced very rapid growth of computer and internet penetration, inspired the stepping stone hypothesis in relation to public and private ICT access: public access venues were seen as providing a stepping stone to reach the ultimate goal of widespread private access. The numerous initiatives to boost public access to address the digital divide were short lived — with the notable exception of connected libraries, which continue to thrive. The experience of Lithuania illustrates the demise of numerous cybercafés, as home uptake of ICTs has accelerated in recent years, to the point that most remaining public access venues are libraries. However, extrapolating from these experiences and generalizing for developing countries would be simplistic.

The study examined whether public access is a stepping stone to private access, or, alternatively, whether it represents an enhanced user experience that offers benefits beyond those available through private access. The answer to this question has implications for a range of interventions that could be critical for the future of public access.

The user survey found that a large number of public access users in fact own computers with internet connections. In Brazil, for example, the internet penetration at home among venue users is an impressive 40% (compared with the national average of 24% in 2009). In Chile, one-third of public access users have internet connections at home, as do 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 exceeds the average home penetration in that country. Based as they are on a large number of surveyed

users, these findings provide a concise answer to the question of continued relevance of public ICT access.

What attracts so many to public access, when they could use ICTs in the comfort of their homes? Users cite several reasons: better equipment, faster connections, access to infomediaries and peers for needed help, and the sharing experience. Other reasons might be suggested, such as competition from family members or the benefits of socialization. Whatever the reasons, the fact remains that having home access does not lead to the disappearance of those users from public access.

On the other hand, data from the non-user survey also confirm that the stepping stone phenomenon is also at work, and indeed quantify it. The data reveal that about 15% of non-users are former public access users who currently use ICTs elsewhere. More than half of this group had been very frequent users (daily or at least weekly), and about three-quarters report that they stopped going because they have private computer and internet access.

Both tendencies, then, can be observed: some users stop going to public access venues as a result of private access, while a very large number of people with home access continue 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 overall evolution of the penetration and use of ICTs, pointing to the mutual reinforcement of multiple modalities of access. Based on all indicators to date, 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 high levels of home connectivity, so that, even under the substitute scenario, public ICT access will remain a critically important service. Finally, some of these countries may be developing their own distinctive modality of ICT use, reflecting their own cultural norms, communal attitudes, or practical considerations. These modalities may emphasize the value of rationalizing use, sharing premises or workstations, and learning collaboratively. Both of these trends, the rate of adoption and emergence of distinctive modalities, need to be monitored over time.

3.   Uses and impacts by priority populations

The goal of most public and donor-funded initiatives is to reach priority populations that are perceived as disadvantaged in some way (low socioeconomic status, unemployed, at-risk youth, rural residents, minorities, women, etc.). This study has focused on the uses and impacts of public access by such groups, finding in almost every instance that their experiences are on par with their more advantaged counterparts. These are encouraging findings for policy makers.

At the same time, the evidence shows that most public access users are of middle socioeconomic status, as well as urban, male, and young. As this observation is often raised as a point of criticism of public access, the user profile warrants discussion here.

Youth: The importance of providing increased opportunities for youth is generally recognized. Much of the developing world is experiencing a "youth bubble," constituting a large proportion of the unemployed (even after years of education). As this is the group most easily able to use and adapt new technologies, there is a strong argument to be made that expanding the youth's access to computers and the internet — including such public access services as training, distance learning, and job placement — will yield broad economic benefits in the long term. Fortunately, young people also seem to find public access venues to be safe and supportive environments for engaging with technology and one another.

Socioeconomic status: Expanded ICT use by middle-income residents is also likely to have a positive impact on a country's economic and social development. As a country struggles to expand the middle class, the opportunity for employed adults to use public access ICT facilities (including for business purposes) is a trend to be embraced. Without public access venues, these middle class users would be without digital access, at serious cost to their livelihoods and to the national economy. Moreover, non-users reported a sharing effect, as these relatively better-off or better-educated users perform digital tasks "by proxy" for their non-user friends and relatives.

Gender: In many countries, women continue to face obstacles to public access patronage. Addressing this inequity is essential. There are encouraging trends: particularly as connectivity rates rise, females are represented in public access facilities in larger proportions (as in Chile). (In Bangladesh, where there are cultural barriers to women's access, the institution of door-to-door "infoladies" provides some access for women in a private setting.) Libraries and telecenters appear to be particularly welcoming to females, perhaps reflecting the way they are configured and staffed. Female users benefit equally to males, so it is important for policy makers and practitioners to take steps to ensure the broadest participation of females.

Urban/rural: The concentration of public access venues in urban areas is not surprising. Venues follow economic activity and population density — and overwhelmingly, cybercafés are filling this market need. Users of cybercafés report significant positive impacts across all priority domains, although at a slightly lower rate than users of libraries. Most rural areas would lack venues entirely if it were not for public (government) and donor provision, especially in countries with lower connectivity. Since rural venue users (controlling for experience and other factors) report benefits similar to urban users, public policy needs to consider appropriate strategies both for densely populated areas (which are typically well-served by cybercafés) and for sparsely populated rural regions.

4.   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 the "productive" uses of computers, and any sign of low usage in these target domains is often considered indication of a failure of the public access model. A similar critique relates to observed high levels of usage in the domain Communications & Leisure: Skype and Facebook as well as computer games are typically viewed as frivolous (non-instrumental or unproductive) activities that do not merit public subsidy.

The study data indeed show a relatively low percentage of users (below 40%) who report impacts in most of the priority domains, except Education. The Communications & Leisure domain shows a much higher percentage. However, those users who are engaged in the high priority domains report that they do achieve specific tasks and experience positive impacts in very high proportions. Low popularity of an activity, or low frequency of use, does not mean low *importance*. Even though twice as many users reported a positive impact in *pursuing interests & hobbies* compared with *health*, accessing critical health information is likely quite important to those who use public access for this purpose.

It may be appropriate to characterize people's activities at a public access venue as either *routine* or *episodic*, in terms of frequency. Routine uses are those activities one is likely to be engaged in on every visit, or nearly every visit, to a public access venue. Communications (email, social networking, etc.) top the list of routine activities, along with *meeting new people* and *pursuing leisure activities*, among others. For student users, educational activities are also most likely a routine use. Episodic uses are done less frequently: a few times per year (e.g., accessing government services) or even less frequently, as need arises (e.g., looking for a new job). Since (as the data show) public access users visit venues frequently,

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and in many cases daily, their episodic uses are likely to be varied. One is unlikely to access a government service every day, in contrast to (for example) sending an email to a friend. It is therefore not appropriate to assess every activity by the same standard. Rather than comparing usage rates for different activities, it may be more productive to evaluate usage 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 some context for the sometimes numerous "no impact" responses for particular impact categories. In fact, "no impact" responses are overwhelmingly linked to *non-use* in the domain. Non-use, in turn, appears to be related to whether or not a particular area of activity is 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 not likely 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, this study challenges 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 study found no difference between instrumental and non-instrumental users in their ability to accomplish specific instrumental tasks. This has important implications for public policy, in recognizing the utility and value of this extremely common area of activity. It is significant also for the operators of public access facilities, 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.

5. Does venue type matter?

At the most basic level, research found that people everywhere crave access, defined most simply by availability of internet connection and computer equipment. The data on willingness to pay show that people — both users and non-users — will pay to keep public access open in their communities. Travel data show that few travel more than 2 kilometers to visit a public access venue, and most travel less than 1 kilometer. This means that the vast majority of people use cybercafés, as the most widespread type of venue.

Cybercafés do a credible job of catering to users' needs, including in the area of infomediation: cybercafé staff went to similar lengths as library and telecenter staff to meet people's technical and information needs. This may contribute to the high proportions of positive impact reported by cybercafé users. It is a welcome finding, given that cybercafés are ubiquitous in most parts of the developing world — and unlikely ever to be outnumbered by public/donor supported venues. In short, cybercafés serve as an important component in public ICT access.

Other factors can be important, however, especially to certain users and populations. More libraries and telecenters offer in-house training than cybercafés, by a ratio of six to one. For introducing and familiarizing new users with ICTs, this may be a critical service in many countries, especially those at lower levels of connectivity and those that have sizeable non-user populations (e.g., elderly, rural

residents). The Bangladesh data further illuminate the critical role of publicly/donor-supported venues. Nearly half of the respondents use staff assistance every time or most times they visit a public access venue. In rural areas, moreover, public access would be unavailable for most without the presence of telecenters. In terms of gender, too, the data suggest that libraries and telecenters do a better job of welcoming females.

Looking at the priority domains, there also are differences. Library users report positive impacts in significantly higher proportions than cybercafé users in such areas as Culture & Language, Governance, and Health. While researchers have yet to fully analyze the reasons for this, they are likely rooted in the characteristics of the venue — the staff, services, and overall environment.

Another important consideration is the fact that all public libraries, and nearly three-quarters of telecenters, are affiliated with a larger entity. In the case of public libraries, this is the national public library system. Telecenters are affiliated through both national and sub-national organizations as well as networks of varying types. These horizontal and vertical affiliations enable services to be rolled out across a country to target particular users and specific uses. In the course of this study, for example, Chile initiated a new e-Government procurement service, requiring all small businesses bidding on public projects to use the new online system. Libraries and telecenters were key instruments for registering and training people on the new system.

If people had the option, they might choose a library or telecenter over a cybercafé. The benefit cost analysis sheds light on this question. In those locations where people are likely more familiar with the different venue types, non-user willingness to pay showed a clear preference for libraries and telecenters. In Chile, the surveyed country with the greatest number of public libraries as well as a large number of telecenters, non-user willingness to pay was highest for libraries followed by telecenters, with cybercafés in last position. In countries where connected libraries are largely absent — Bangladesh and Ghana, in the study's sample — there is greater willingness to pay for cybercafés than for (largely unavailable) libraries or telecenters.

All told, it remains to decision makers to judge whether the value added of libraries and/or telecenters justify the resources required to support these venues. This will likely vary on a country by country basis.

6.　Measuring public access impacts

With significant resources expended on public access facilities (particularly non-profit), policy makers naturally seek evidence of social and financial returns on investment — which are notoriously difficult to pin down in direct and unambiguous ways. (See Patricia Rogers, 2008, for a useful discussion of the use of program theory to evaluate complicated and complex aspects of interventions.) Is it possible to infer causal linkages between a user's activity at a public access venue and any subsequent changes in the user's life? Can those changes be *attributed* to public access? Or did the venue make a *contribution* 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, researchers 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 researchers 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

gotten the job? Or, if they did not get the job — possibly because they lacked the qualifications — 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 art. 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 contributory 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. It is important when considering the impacts of public access to adopt a realistic stance in terms of expectations, and to recognize the true, lasting value of the services these venues provide.

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 that do. The study has demonstrated that both of these groups derive benefits from, and ascribe value to, public ICT access.

Across all categories of use and domains of impact, country context matters. The research results presented here are not uniformly generalizable to other countries, though every effort is made to draw out those elements of the public access phenomenon that seem to cut across contexts. Nevertheless, evidence is coming together to suggest that countries with similar socioeconomic environments may experience similar results. Critically, the broader national environment needs to be addressed in parallel with the rollout of public access, to enable this resource to deliver expected results.

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 by not being able 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 public access is examined 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, there are questions to be asked about the timeframe for trying to identify impacts. With very different rates of ICT diffusion and public access deployment and uptake, what are the implications for the rate of emerging impacts? Will these take six months or two years, or more? Do some impacts take longer to manifest than others? And do some impacts either intensify or dissipate over time?

Summary

The impacts of public access cannot be measured in a generic fashion. Assessments must take into account different modes of venue configuration, specific facilities and services offered, and the heterogeneity of user populations, as well as the country context of the information economy. Impact assessments need to be designed for the appropriate levels and targets of analysis — whether the target is broad basic technology access or improving maternal health care.

For a meaningful economic and social life, people need multiple capabilities: a means of generating income; opportunities for formal and informal learning; the ability to maintain their health and well-being; access to local and national government; the ability to exercise informed democratic rights and obligations; and the ability to observe and participate in the production of their cultural heritage. Much 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 the human importance of leisure be devalued — 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 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 into college, improved health, or preservation of culture. Measuring the precise contribution of public access to such indicators, among the mix of other local and national resources, is a complex task, one beyond the scope of the Global Impact Study. The Global Impact survey data are openly accessible, however, and others are invited to make use of these data to further explore the issues raised here and more. Researchers hope that the results presented here will contribute usefully to the body of knowledge on the impacts of public access, and that they can help inform decision-making processes when considering the potential of public access as a factor in meeting broad policy objectives.

10. Moving Forward: Recommendations

A primary aim of this research has been to generate actionable information for the Global Impact Study's key constituencies: decision makers in government and donor organizations, leaders and practitioners of public access programs, and researchers. The findings presented in this report illuminate many facets about when, how, and why impacts occur in public access venues. These findings suggest a number of possible courses of action for advancing the future role of public access.

For policy makers and practitioners, these recommendations are intended to provide a framework for thinking about public access ICTs, rather than to advocate for a set of specific actions in particular circumstances. The public access landscape is complex, and only made more complex by layering on socioeconomic development targets. And in most cases, policy makers and practitioners will be weighing different priorities, goals, and conditions on the ground: there is no one-size-fits-all scenario.

Government and donor organizations

Governments, multilateral agencies, foundations, and other public and private organizations are the primary supporters of the public access model. Many of these entities are currently investing significant resources in public access, others have done so in the past, and still others are contemplating entry into this field. The following recommendations seek to inform the deliberations, decisions, and implementation strategies of organizations across this spectrum.

1. **Support the wide availability of public access venues.**

    Public access is currently, and will likely remain, a valuable resource for countries worldwide. This research finds overwhelming evidence that public access is filling multiple needs for all population groups, from youth to females to the unemployed to rural residents. These needs are not being met by mobiles or other information and communication resources. At a very fundamental level, the value cannot be overstated of a *community hub* that enables people to engage with each other and with technology in a physical setting. The benefits that accrue through encounters with other individuals — whether with venue staff or friends, intentional or serendipitous — cannot be easily duplicated via the alternatives.

    Governments and donor organizations should continue to make public access availability a strategic consideration, especially in situations of market failure (e.g., in rural areas). For countries at low stages of connectivity, public access can make a strong contribution as a viable policy option for decades to come, as private access is unlikely to become widespread in the near future. Countries with higher connectivity can also experience far-reaching benefits, however, in view of the range of reasons (discussed in Chapters 3, 4, and 5) for users to patronize public access.

2. **Use existing infrastructure.**

    All venue types have value, as shown by the data. At the same time, sustainability is known to be a persistent challenge, particularly for government- or donor-supported venues. Accordingly, decision

makers should begin by viewing the landscape to see what already exists. In most countries, this will be libraries and cybercafés.

In the surveyed countries (apart from Chile), only a small fraction of public libraries were equipped with computers and the internet. This represents a significant underutilization of the 230,000 public libraries in the developing world. A significant advantage of public libraries is that they are affiliated at the national and/or subnational levels, allowing for large-scale program implementations to reach particular populations with targeted information resources and services. Furthermore, the data shows venue differences in user profiles, activities, and impacts that often favor libraries. Directing investments to these institutions is likely to be an efficient and effective strategy.

Cybercafés far outnumber other forms of public access, so that one element of a strategic approach must be leveraging their ubiquity. This will likely require creative approaches. Cybercafés are independent businesses that come and go, and they are mostly unaffiliated with associations or other networks through which higher level policies or programs could be diffused. Moreover, the evidence suggests that cybercafés may not be catering to important groups, such as females, as libraries and telecenters have done. Even so, their numbers cannot be ignored, as they constitute a viable channel. Policy makers need not choose among libraries, telecenters, and cybercafés. There are strong public good arguments to be made, though this project did not uncover specific evidence to advocate for a blanket public goods approach.

3.   **Provide, and publicize, domain-specific information and services through public access venues.**

Numerous efforts in recent years have focused on developing and distributing domain-specific ICT applications, in health, agriculture, education, and other areas. Even for the many users of the mobile phone platform, however, large gaps exist in awareness and skills needed to use these applications, services, and online resources. The evidence shows that public access venues are important for users with needs in these domains. It also shows that many people may be unaware of such resources, even though they may be offered at public access venues. Public access can play an important function not only in delivering domain-specific resources but also in actively popularizing those resources, whether online or offline. Such efforts are made more feasible through public access venues that are part of large networks.

Access to domain-specific resources was an explicit goal of many early public access initiatives — efforts that were hampered in part because relevant resources were not as plentiful a decade ago. This situation is rapidly changing: ongoing work is integrating ICTs into health, education, and other areas. New efforts to ensure that public access venues can serve these needs are likely to have better results than before. Formal partnerships with public access venues are not necessarily required. Another approach would be to make specific services available online, share this information with venue operators, and ensure that they are adequately trained to assist users of these services. These steps could provide the foundation for public access venues to support promotion and delivery of important domain-specific resources. (See below, Practitioner recommendation 5.) Opportunities to leverage domain-specific services in collaboration with public access venues should also be considered. In the governance domain, for instance, public access venues could be used to host data hackathons, develop mobile applications, conduct public awareness campaigns, and undertake other activities that engage the citizenry both with technology and with their governments. For public access to play a more integral role would require proactive collaboration among government policy makers and donor organizations.

4. **Embrace communications and non-instrumental uses.**

The hours that venue users devote to communications, social networking, and other "non-productive" uses of technology should not be considered detrimental, but rather included among the objectives served by public access. Many public and donor-supported venues place restrictions on these uses, whether because of resource constraints or unduly narrow assumptions about what constitutes productive use of ICTs. This research showed that these uses in fact build skills and support instrumental aims. Increasingly, people access news resources and other essential information through social media applications rather than traditional websites. More importantly, users are sharing, collaborating, learning, and creating by making use of the panoply of online applications.

Leisure activities, such as games, build skills. But even when they do not produce such a highly desirable or sanctioned outcome, supporters may want to consider that such activities constitute behaviors that are as legitimate as any other "serious" activity.

5. **Assess performance against realistic measures.**

Governments and donor organizations should not place unrealistic expectations on public access venues and programs. It is important to acknowledge the important contribution public access venues make at the most basic level: providing computer and internet access and fostering the development of basic digital skills. Many early public access initiatives were judged failures because users were not engaged in domains of Health, Government, and the like, at the activity levels hoped for by the planners.

This project's findings suggest that it is important to re-think how to assess venue uses, especially for categories of use that are episodic rather than routine. The data show that different people have different needs, and their needs vary at different times in their lives. The value of public access in these priority areas is that *the venues are available when individual needs arise*. The use of episodic services cannot be usefully compared to uses that are routine, such as communications. Stakeholders can have confidence in the motivations and legitimate needs of the people who avail themselves of public access venues. Finally, the performance of venues should be assessed based on a well-grounded appreciation of what public access can and cannot do.

Practitioners

Public access practitioners — librarians, infomediaries, venue staff — operate on the front lines of the public access phenomenon. Their capabilities and modes of service delivery, along with the affordances they enable, can directly influence how users and the general public respond to public access, and thus the level of impacts.

1. **Adopt a flexible approach to rules.**

Some limits on users' behavior are necessary to ensure respect for people and property at a public access venue, and to promote venue objectives. Venue rules often target issues such as: noise levels; use of particular computer software; performing certain actions on computers (such as downloading material from the internet or social networking); the amount of time spent on a computer; use of

mobile technology; and others. Such restrictions are more common in libraries and telecenters than in cybercafés.

However, some restrictions, while well-intentioned, can inhibit some of the behaviors that are most likely to lead to development outcomes. The findings show that playing games develops transferable computer skills, and that people use social media to access educational and other resources, as well as other positive results from activities that are sometimes prohibited.

The recommendation is to be sensitive to context — the needs of users, societal trends, new knowledge regarding useful activities — while making adjustments to policies as appropriate to fit the situation. There is often a fine line to be walked in responding to user needs , especially as public access venues attract a diversity of patrons with different preferences regarding environment (e.g., quiet or noisy, private or open). The key is to be flexible to emerging needs, although no single venue may be able to meet them all.

2. **Embrace mobile phone services.**

The study results reveal that the vast majority of public access users are also mobile phone owners. Clearly, mobile phones currently do not constitute a threat to the relevance of public access facilities. To the contrary, mobile telephony presents opportunities for venues to leverage or enhance their services. Certainly, holding a mobile phone conversation in the confines of a library, for instance, could be disruptive to patrons who are trying to study (see rules above). However, there are other forms of use that if allowed, could heighten the quality of a user's experience in the venue. Public access practitioners could consider introducing mobile-based services that allow people to further fine-tune their strategic combinations of the variety of digital technologies available to them — such as printing directly from phones, accessing wireless networks on phones, reserving a computer via SMS, using a cable or Bluetooth to transfer files between phone and computer, and charging phones.

3. **Do not rule out fees too quickly.**

Evidence from this study shows that users are willing to pay for ICT resources available at public access venues. Venues facing sustainability pressures may want to consider a fee structure as an option for supporting their activities. However, a decision to institute fees should take into account the socioeconomic status of any priority groups of users or potential users, who may be unable to pay for access, as well as the range of alternative ICT access options. Indeed, people's willingness to pay for public access may in some cases entail the sacrifice of other needs, and this may not be ideal.

4. **Attend to venue design and the environment for infomediation.**

There are a number of features of public access venues that attract users and encourage productive behavior. Knowledge workers (librarians, other trained staff) are particularly valued, and not just for helping inexperienced users. Effective knowledge workers know how to scan the environment and decide when to stay in the background, leaving users to their own devices, and when to offer assistance, perhaps even to experienced users. This broader function of "infomediation" creates the appropriate environment for users to operate based on their unique capabilities and needs, a critical factor in user experience.

Another feature is venue configuration. The desire to be with friends or colleagues is a huge draw for public access, and some users report extensive sharing and peer learning in public access venues.

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Facilitating this sort of interaction requires attention to how the space is configured, including the placement of computers (in open spaces or private booths). As with the recommendation about rules, attention to venue design and infomediation practices will require balancing the sometimes contrasting needs of users.

5. **Make users aware of content availability in priority domains.**

The study shows that users may not engage in a particular activity at a public access venue because they "did not think of it." This suggests that they are not aware of the relevant resources, or they perhaps assume that the venue has no resources in that area. Practitioners should ensure that they publicize the types of resources they have available, so that, as the occasion arises, users would have public access in mind as an option for addressing specific needs.

Researchers

A primary aim of this project is to re-invigorate debate about the value of public access and to spur new research. Accordingly, the project adopted the principle of open research and open data. These recommendations include specific topics for possible exploration, as well as other opportunities and reflections on new research directions.

1. **Build on methodological lessons.**

Much work remains to be done to develop and strengthen methodologies for conceptualizing, identifying, and measuring public access impacts. In pursuing this, the project team offers the following considerations:

- Country context matters enormously, in particular regarding overall connectivity, presence of different models of public access, extent of public access use (current and historical), and public policies. These differences influence the configuration of the public access landscape, which in turn complicates the pathways to impact. This variability of context needs to be taken into account when attempting to produce generalizable findings, with challenging implications for methodological and analytical decisions.

- Public access exists within an ecology of information and communication resources and practices. This ecology needs to be accounted for at the research design phase as well as when analyzing and interpreting data. As the survey data showed, both public access users and non-users have a range of tools and resources at their disposal for connecting to their immediate networks and to the rest of the world — including print and other mass media, desktop computers, mobile phones, and other human beings. These connective resources also include use of public access venues. For some purposes, of course, other resources may be more useful (or impactful) than public access venues. Rather than primarily seeking to measure "impacts," a more productive approach to evaluating the social or economic value of public access could be to explore how public access venues fit into this information ecology. This could lead to more accurate representations that neither inflate nor deflate the importance of public access venues.

- In developing impact indicators, care should be taken to ensure that venues are not being assessed in terms of unrealistic objectives. (See for example the discussion of *routine* versus

episodic use in Chapter 9.) The study has attempted to clarify an important distinction between digital inclusion impacts and other types of impact, including social and economic impacts that may be only indirectly associated with the use of a public access venue. There are also different implications for evaluating the impact of a particular public access venue, versus assessing the impacts of public access as a general phenomenon. Researchers have a responsibility to help develop appropriate measures of the effectiveness of public access venues, and to engage with policymakers, development agents, and practitioners to moderate unrealistic expectations.

▪ Collecting financial information from diverse public access venues is a difficult challenge. Rather than attempt large-sample survey methodologies, a more viable strategy would be an in-depth method, involving smaller samples of venues, to cooperate with respondents in producing accurate cost data. Building trust with the informant over time, scheduling meetings well in advance, and prepping the informant with the questions in advance are important steps. Such an approach should result in a smaller sample of more reliable information. This requires field time of selected researchers who are able to communicate and build trust with key informants.

2. Conduct deeper analysis on questions raised by this report.

The project team was inevitably limited in the range of questions analyzed in this study, leaving a plethora of other questions for future research. Moreover, the findings revealed through the analysis also generate new questions. Today's researchers must address an information and technology landscape that is significantly different from five years ago, when this research was designed — potentially raising new questions as well. Researchers can make use of the inventory and survey data made available by this project, to enable analyses such as:

▪ Uncovering the conditions under which impact occurs, linking user outcomes to such variables as a venue's technical infrastructure, rules, knowledge workers, and location
▪ Further exploring specific user populations, such as youth, women, unemployed, etc.
▪ Conducting GIS analysis, using the project's inventory of 65,000+ geo-located venues
▪ Further analyzing past impacts and indirect impacts of public access

3. Explore open inventory and survey data.

The Global Impact Study was designed from the outset to follow principles of open research, embracing the goal of generating and making publicly available *all datasets and other resources,* in addition to project publications. In keeping with this aim, the survey instruments were designed to be especially broad and detailed: the goal was to build a base of information that could be shared with other researchers, rather than to collect just the specific data for this report. Indeed, the results presented in this report represent only a small fraction of the research accomplished.

Researchers interested in public access and impact assessment are encouraged to explore the data and run their own analyses to provide further illumination on this topic and to suggest further areas of investigation. In addition to the data, all research tools (e.g., survey instruments, sampling strategies, and inventory data template) are also made available, for use in conducting additional fieldwork in this area. Researchers working in Mozambique and Liberia have already replicated the inventory and surveys (articles forthcoming).

All datasets, instruments, codebooks, methodological notes, and other resources can be found on the project website: www.globalimpactstudy.org.

Appendix 1: Taxonomy of Public Access Venues

The taxonomy is composed of two distinct parts: a global taxonomy and a local taxonomy. The global taxonomy is composed of a set of five fields that cannot be adjusted. These five categories were chosen after discussion among project members, taking into account the suggestions of local data collection teams of categories they considered useful for describing public access ICT venues in their countries. To maintain the goal of collecting data uniformly across countries, those suggestions were weighed against researchers' ability to collect data for those categories in other countries. The resulting global taxonomy fields are shown below.

Global taxonomy of public access venues

1. Ownership
      1.1 Private
      1.2 Public
      1.3 NGO
      1.4 Other
2. Business mode
      2.1 For-profit
      2.2 Not-for-profit
3. Internet access fee
      3.1 Free
      3.2 Paid
      3.3 Not applicable (for venues with no internet access)
4. Venue type
      4.1 Library
      4.2 School
      4.3 Stand-alone facility (i.e., telecenters and cybercafés)
      4.4 Other public access location
      4.4.1 Government building
      4.4.2 Post office
      4.4.3 Religious institution
      4.4.4 Other
5. Mobility
      5.1 Stationary
      5.2 Mobile

Country research teams, processes, and iterations

The design and development of the inventory, data collection tools, and databases involved the following overlapping stages:

- Identification of relevant data and inventory components.

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- Development of taxonomy, complete with a hierarchical structure for categories that could be used to describe different types of venues, and definitions.
- Preparation of data collection instruments and guidelines. This involved the creation of instructions for data collection, the inventory database template, and the data dictionary.
- Feedback from local research teams. Spread out over several months, this stage involved using a wiki as well as in-person discussions to gather feedback from the data collection teams on the feasibility and usefulness of the proposed inventory and taxonomy in each of their countries.
- Revision of inventory components, instrument, and guidelines. There were several iterations of the inventory and taxonomy that took into account feedback and suggestions from the data collection teams and other researchers on the project team.
- Development of an online database to store inventory data. To ensure data were collected and submitted in a consistent format, this process began in tandem with the development of the taxonomy.
- Testing and finalization of the data collection instrument. This stage incorporated lessons from the inventory testing stage to create the final inventory and data collection tool.
- Data dissemination, through a dedicated site of the Global Impact Study.

Even more flexibility was afforded to the country research teams through the possibility for further customization. The resulting local taxonomy, unlike the global taxonomy, would allow researchers to include data that they considered vital but that are unique to particular countries. These types of data may not be universally applicable and are thus not appropriate for the global taxonomy.

The *ownership* category relates to the legal description of the venue and not its source of funding. Non-private venues are categorized as "public" rather than "government," since the parameters of what constitutes a government sector is not the same across countries. In many countries, governments have established agencies that are technically independent but nonetheless public entities. For example, an NGO might receive all of its funding from a government, but would still be categorized as NGO. Similarly, a government program might receive donated computers and connectivity from the private sector, but it is still a publicly-owned facility.

The *internet access fee* was selected as the most appropriate taxonomy category to capture data on venue service charges. Different options such as "ICT usage fee" were considered, but it was concluded that they would not yield useful or usable data, because of the range of pricing structures for different public access ICT services. A category such as "hybrid fee structure" would also not be useful: 1) further breakdown would be needed to understand which services are free and which are paid; 2) this level of granularity may not be possible, under the taxonomy requirement that data only be acquired through administrative data sources.

For the *venue type,* the terms "telecenter" and "cybercafé" were deliberately omitted as sub-categories, because definitions of these types of venues vary widely. Instead, a generic designation of "stand-alone facility" was used to identify such venues. The *ownership* and *business mode* taxonomy categories provide additional detail to distinguish between telecenter-type (public or NGO owned, not-for-profit) and cybercafé-type (private, for profit) venues. Although not a perfect solution, this allows for greater control in data collection without assigning a rigorous definition that may be inappropriate or difficult to implement in some countries. In instances where a venue is located within an entity that also has the potential to provide ICT access (for example, a cybercafé located within a library), the taxonomy uses the broadest description of the location. Thus, for a cybercafé located within a library, the venue would be

categorized as a library. The local taxonomy as well as the comments fields can be used to provide context for such instances.

The incorporation of a *mobility* category accounts for venues that are mobile in nature, such as computer services delivered via boat or bus. The mobile category only applies to venues that are mobile in all their operations, rather than fixed venues that have a mobile component. For example, a fixed location library that sends buses to provide library service to surrounding communities would be classified as a stationary venue. Again, the local taxonomy and comments fields can be used to provide context in such instances.

Since the definition of a rural or urban area varies from country to country and source to source, the designation of a venue as rural or urban is based on research teams' knowledge of local definitions. With the geo-coding of the inventory data, different definitions of rural and urban can be applied to the data in the future (e.g., based on population size or distance from a central location).

Location and contact fields

The inventory contains a total of 64 discrete fields representing three major categories: taxonomy fields, geographic location and contact fields, and comment and supplementary fields.

- Venue name (in the local language and translated into English).
- Venue start date, as well as (if relevant) venue close date or future start date. Data on venues that closed before the inventory data was submitted, or were expected to open in the future, were not collected with the same rigor as data for currently operating venues. However, where such data were available, data collection teams were encouraged to submit them.
- Venue address information, broken down by street name, building number, city, county, postal code, and any applicable regional units.
- Venue contact address if different than the physical address (for example, if the contact address is that of the program that operates the venue).
- Direct contact information of the venue, including phone, fax, email, VOIP, and website (these fields are considered private and will not be publicly available).
- Venue contact person's role, address, phone number, and other contact information (these fields are considered private and will not be publicly available).

Additional data fields in the inventory include the following: confirmation of the presence of ICTs at the venue; other venue information, including programs in which the venues may belong; source of data and last data verification date; and comments/notes.

Appendix 2: Country Definitions

Urban and rural by country

Bangladesh

Urban and rural definitions for Bangladesh come from the Bangladesh Bureau of Statistics (BBS).[36] The BBS defines an urban area as the developed area (i) around an identifiable central place, (ii) where amenities like metalized (paved) roads, communication facilities, electricity, gas, water supply, sewerage connections usually exist, and (iii) which is densely populated and a majority of the population involved in non-agricultural occupations.

Brazil

According to the Brazilian Institute for Geography and Statistics (IBGE),[37] the government agency for geography and statistics, an urban area is defined as the area located inside the urban perimeter of a city or town, and this perimeter is determined by a city law. A rural area is defined as the area of a municipality located outside the urban perimeter.

Brazilian law Nº 5.172 (October 25, 1966) defines as urban the area that has a continuity of constructions on it, and where certain social amenities are located. According to the law, to be considered urban an area must have **at least two** of the following improvements made and maintained by the government:

1. Sidewalk with channels or pipes for rainwater
2. Water supply
3. Sewage system
4. Public lighting system, with or without poles for household distribution
5. Elementary school or health service, within 3 km

Chile

The definition of urban and rural in Chile is based on the National Statistics Institute (INE).[38] The INE defines an urban area as a set of houses concentrated, with more than 2,000, or 1,001 to 2,000, with 50 percent or more of its economically active population engaged in secondary and/or tertiary activities. In addition, areas that have tourism and recreation features and contain more than 250 houses but do not

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[36] http://www.unescap.org/huset/women/reports/bangladesh.pdf (page 21) (last accessed October 25, 2012).

[37] http://www.ibge.gov.br/home/geociencias/cartografia/manual_nocoes/elementos_representacao.html (last accessed October 25, 2012).

[38] http://www.ine.cl/canales/chile_estadistico/demografia_y_vitales/proyecciones/Informes/Microsoft%20Word%20-%20InforReg_UR.pdf (last accessed October 25, 2012).

reach the population requirement are also considered urban entities. Rural areas are defined as places having low population density, primarily extractive activities, and a population between 1,001 and 2,000 people.

Ghana

Urban and rural definitions in Ghana come from the Ghana Statistical Service,[39] which defines a rural area as a town/community with a population less than 5,000. All other areas are considered urban.

Lithuania

In Lithuania, urban and rural areas are identified using the definitions from Statistics Lithuania.[40] Urban population refers to persons living in cities and towns, i.e., densely built-up residential areas with a population of more than 3,000, of whom more than two-thirds work in industry, business, manufacturing and social infrastructure. In a number of towns, the population may be less than 3,000 if those residential areas had already had the status of a town before the Law on the Territorial Administrative Units of the Republic of Lithuania and Their Boundaries was enacted (on 19 July 1994). Rural population refers to persons living in residential areas lacking urban characteristics (small towns, villages, isolated farmsteads).

Philippines

Urban and rural areas in the Philippines are classified based on administrative divisions (i.e., cities and municipalities). Cities are automatically classified as urban. First class municipalities are also classified as urban. Second-class to sixth-class municipalities are classified as rural. This method was adopted for the study, since using the definitions of the National Statistical Coordination Board (NSCB)[41] would leave the Philippines with practically no rural areas.

The NSCB defines an area as urban if it meets the following criteria:

- In their entirety, all municipal jurisdictions which, whether designated chartered cities, provincial capital or not, have a population density of at least 1,000 persons per square kilometer: all barangays;
- Poblaciones or central districts of municipalities and cities which have a population density of at least 500 persons/km^2;
- Poblaciones or central districts not included in (1) and (2) regardless of the population size which have the following:

[39] http://www.statsghana.gov.gh/docfiles/2010phc/Census2010_Summary_report_of_final_results.pdf (last accessed October 25, 2012).

[40] See, for example, the 2011 Lithuania Population Census Brief (http://www.stat.gov.lt/uploads/Lietuvos_gyventojai_2011.pdf?PHPSESSID=07a132c295958bc5907bad20edddc9ba (last accessed October 25, 2012).

[41] "Urban/Rural classification," http://www.nscb.gov.ph/activestats/psgc/articles/con_urbanrural.asp (last accessed October 25, 2012).

- o street pattern or network of streets in either parallel or right angle orientation;
- o at least six establishments (commercial, manufacturing, recreational and/or personal services);
- o at least three of the following:
  - a town hall, church or chapel with religious service at least once a month;
  - a public plaza, park or cemetery;
  - a market place, or building, where trading activities are carried on at least once a week;
  - a public building, like a school, hospital, puericulture and health center or library.
- Barangays having at least 1,000 inhabitants which meet the conditions set forth in (3) above and where the occupation of the inhabitants is predominantly non-farming or fishing.

All poblaciones or central districts and all barrios that do not meet the requirements for classification of urban are considered rural.

Table A.1: Poverty line definitions, by country

	Monthly *Individual* Poverty Line	Monthly *Household* Poverty Line
Bangladesh	BDT 1,300	BDT 1,680.7
Brazil	R 255	R 1,020
Chile	CLP 47,099	CLP 64,134
Ghana	GHC 31	GHC 154
Philippines	PhP 1,403	PhP 7,017

Appendix 3: In-Depth Study Reports

All in-depth studies are being published as part of the Global Impact Study Research Report series. Visit http://www.globalimpactstudy.org/resources/in-depth-study-reports/.

The Impact of Cybercafés on the Connectedness of Children Left Behind by Overseas Filipino Workers
   How do cybercafés function as a means for maintaining familial connectedness, in particular for families divided by migration? Philippines.

The Impact of Information and Communication Technologies at Libraries on Sustainable Livelihood Strategies and Outcomes in Botswana
   What is the impact of ICT availability in public libraries on the livelihood strategies of public access users? Botswana.

Infomediaries: Brokers of Public Access
   How does the role of infomediaries affect the outcomes for public access venue users? Bangladesh, Chile, and Lithuania.

Perceptions of Value for Public Access to Information and Communication Technology in Five Countries: A Mixed Method Benefit-Cost Analysis Approach for Informing Policy
   How willing are different types of users to pay for public access? Bangladesh, Brazil, Chile, Ghana, Philippines.

Public Access, Private Mobile: The Interplay of Shared Access and the Mobile internet for Teenagers in Cape Town
   If everyone carries a private information device in their pocket, is there still a need to provide public access to information technology? South Africa.

Understanding and Rethinking Shared Access: How People Collaborate and Share Knowledge and Technologies in Ghanaian Cybercafés
   What are the forms of collaborative co-present sharing in cybercafés, as well as their advantages and disadvantages? Ghana.

The Value of Non-Instrumental Computer Use: Skills Acquisition, Self-Confidence, and Community-based Technology Teaching
   Are there are objective differences in the generic computer skills of gamers as opposed to "serious" users? Brazil.

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