Who uses ICT at Public Access Centers?

Age, education, gender and income differences

in users of public access to ICT in 25 developing countries

ICIS Conference, SIG GlobDev Workshop, Phoenix, Arizona, Dec 14, 2009

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Abstract

Libraries, telecentres and cybercafés are key points of public access to information around the world. In this first study of its kind, named the Public Access Landscape Study, a global research team led by the University of Washington's Center for Information & Society (CIS) researched public access venues (libraries, telecentres, cybercafés) in 25 countries around the world. The goal of the project was to better understand the needs and opportunities to strengthen institutions that offer public access to information and communication, especially to underserved communities, and with a particular emphasis on the use of information and communication technology (ICT). This paper reports findings from this study, particularly in relation to the users of the different types of venues. Given that most public access venues are located in urban areas, and given the strong prevalence of cybercafés as the most common public access venues in the majority of the countries studied, a strong urban bias was confirmed. An age divide was by far the most significant characteristic of the surveyed population, with youth (15-35 year-olds) accounting for the vast majority of users of these venues. Also significant was that most users were high-school educated, and most were lower to middle-income. Older individuals, those with high or low education levels, and those with higher-incomes did not frequent public access venues nearly as much as younger, poorer, and more modestly-educated individuals. However, contrary to current literature on this topic, gender may not be as strong a differentiator of use of public access venue as other studies report. With few exceptions, women and men participated almost equally in most of the public access venues

studied, although men tended to use cybercafés more often. This paper is one of a series of papers presenting findings from this large study across different types of public access venues in 25 countries.

Findings from this study can inform policymakers about opportunities and challenges to support and strengthen public access venues and help reach underserved populations with meaningful access to ICT.

INTRODUCTION

Information and communication technologies (ICT) play a critical role in global development, and venues such as libraries, telecentres and cybercafés, which offer public access to ICT, can make ICT accessible to broader sectors of the population. This broader access to ICT can have positive consequences to the social and economic development of marginalized and underserved populations and help bridge the so-called digital divide (Barzilai-Nahon et al., 2009, Warschauer, 2003). To understand what is happening at different types of public access venues, how they are meeting the needs of underserved communities in different countries, and how they can be strengthened to better contribute to global development, in 2007-2008 we conducted a study –the Public Access Landscape Study—of public libraries, telecentres and cybercafés in 25 developing countries[2] around the world. The countries were carefully selected taking into consideration population, culture, economy, geography and other factors relevant to ICT and development. The study was done in partnership with local researchers in each country. It was designed with multiple data collection and analysis methods to provide data that would give broad insight into the nature of these public access venues, and how ICT was being used in them and by whom.

Approximately 25,000 people were surveyed in approximately 500 venues, believed to represent about 250,000 public access venues in the countries studied. A "public access venue" is defined as one that offers public access to information with services available to all and not directed to one group in the community to the exclusion of others. We were especially interested in venues that had provisions made to ensure services are equally available to underserved and minority groups who may not have access to the mainstream (based on International Federation of Library Associations and Institutions, 2001). The study focused primarily on public libraries, community telecentres and cybercafés as key public access venues in the countries studied.

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[2] Algeria, Argentina, Bangladesh, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt, Georgia, Honduras, Indonesia, Kazakhstan, Kyrgyzstan, Malaysia, Moldova, Mongolia, Namibia, Nepal, Peru, Philippines, South Africa, Sri Lanka, Turkey, Uganda.

While there have been many previous studies about public libraries and ICT (Walkinshaw, 2007, Rutkauskiene, 2008), especially in the US (Bertot et al., 2005, Bertot et al., 2006, Bertot et al., 2007), about telecentres for community development (Best and Kumar, 2008, Etta and Parvyn-Wamahiu, 2003, Fleury, 1999, Kuriyan and Toyama, 2007, Proenza et al., 2002), and to a lesser degree, about cybercafés and their contribution to social and digital inclusion (Gurol and Sevindik, 2007, Haseloff, 2005), we found no previous studies that have done systematic comparison of different types of venues and across multiple countries.

In this study we did not analyze use of ICT in non-public venues (home, school or work), the use of newer technologies such as mobile phones or wireless plazas (hotspots), or the use of older technologies such as community radio, TV and press. Important as these communication technologies are, they fall outside the boundary of this study which focuses on ICT in public access venues. Further research can shed more light on the interactions between ICT in public and private venues, and between ICT and other communication technologies of importance for community development.

The public access venues we studied take different names in different countries. Public libraries are often confused with school libraries, other specialized libraries, and community or popular libraries. Telecentres are often labeled community technology centers, communication community centers, or eCenters. We grouped them under the three broad headings in order to streamline the comparative analysis. In addition, some countries studied other types of public access venues of local interest in their context (for example, church or mosque libraries).

Local research teams surveyed a total of approximately 25,000 individuals who were present in urban or non-urban public access venues at various times between August and October of 2008. Local teams followed a common methodological framework for the study that included document review, expert and operator interviews, user surveys, site visits and focus groups. User surveys used by each team were based on a common template that was translated and adapted to the needs and features of each country.

The study is comparative in nature, and provides an initial perspective of broad patterns and relationships based on aggregated data across all countries, with special attention to commonalities across them. Although surveys conducted in each country are not necessarily statistically representative of the population, they do provide valuable insight into the types of

users and their requirements from the facilities studied. The findings we discuss are indicative of trends in respect of user profiles and use, not absolute numbers that apply exactly to any single situation. Given the variations in data collection and sample size, the statistical accuracy of the results is smaller than the interest of the trends they reveal.

The remainder of the paper is organized as follows: In the next section we present description of the methodology used in this research. This is followed by findings and discussion around five issues: the urban bias of public access venues, the predominance of cybercafés, and an analysis of users of public access venues by gender, age, education and income. The paper concludes with a discussion of the implications of the findings. We also identify questions and issues for further research.

METHODOLOGY

In this section we briefly describe the research methodology used in the study, and the methods of analysis for the findings presented in this paper[3]. The main research question was: what are the information needs and opportunities to strengthen institutions that offer public access to information and communication, especially to underserved communities, and especially through the use of digital ICT? This broad question was followed by numerous specific questions about the nature of public access venues in each country, particularly focused on issues of equitable access, human capacity and training, and political and economic environment. In making the methodological choices we took into account the need for common structure and approach to enhance the comparability of the results, as well as the need for flexibility to adapt to the needs and possibilities of each specific context.

Country Selection

A careful selection of countries was critical to this study. The 25 countries were selected based on four sets of criteria:

(1) **demographic data**: size (exclude largest and smallest), population (exclude countries with population less than 1 million, and exclude highest population (India, China)), per

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[3] Note that the complexity of this study cannot be fully accounted for in this short description. For a detailed description of the research methodology see Gomez, R. (2009b) Structure and Flexibility in Global Research Design: Methodological Choices in Landscape Study of Public Access in 25 Countries. In: *CIS Working Paper no. 8*, pp. University of Washington, Seattle.

capita income (exclude countries with per capita income over \$11,116), human development index (HDI below 0.5)

(2) **freedom of expression** (based on Freedom House index[4] and political unrest based on U.S. Dept. of State travel advisories)

(3) **needs and readiness** criteria (composite measures: needs criteria: Income inequality based upon Gini index (2006) from United Nations Development Program; ICT usage: based upon CIA World Factbook (2007); ICT cost: based upon International Telecommunications Union's World Information Society Report (2006). Readiness criteria: Politics: based upon World Economic Forum Global Information Technology Report (2006), Transparency International (2007), World Bank Worldwide Governance Indicators (2006); Skills: based upon International Telecommunication Union opportunity skills index (2007); ICT infrastructure: based upon International Telecommunication Union opportunity network index (2007)

(4) **other tipping factors**: existence of public library systems, regional representation and quality of country research teams.

Research Design and Framework

An iterative research design was conducted in two phases. The emergent insights and discussions from Phase 1 guided and sharpened the focus of Phase 2. From the outset, we identified a framework – Real Access – developed in South Africa by Bridges.org[5]. We adapted and refined Real Access, calling the resulting framework the Access, Capacity and Environment (ACE) Framework, and structured it as a tool to understand the range of economic, political, educational, infrastructure, cultural, organizational, and other factors that affect the way people use ICT in public access venues. The three pillars of this framework are: equitable access: physical access, suitability, and affordability of the venue, technology access; human capacity: human capacity and training (users and staff), meeting local needs, social appropriation; and enabling environment: socio-cultural factors, political will and legal and regulatory framework, popular support.

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[4] Freedom House index: http://www.freedomhouse.org
[5] Non-profit organization based in South Africa, www.bridges.org

Data Collection

Nineteen local research teams were chosen (with some researchers representing more than one country) following an international call for proposals. Lead researchers from each team were brought together twice, at the beginning and halfway through the research process, to discuss the purpose, methodology, and emerging findings of the study. Each team conducted local research in local languages, using document reviews[6], expert interviews[7], site visits[8] , user surveys[9], operator interviews[10], and, in some cases, additional data gathering activities[11]. Detailed country reports were prepared by each local research team using a data-collection template designed to help teams organize their local fieldwork in order to answer detailed questions about Access, Capacity and Environment issues in each type of venue studied. The use of a common research design and methodology helped make data more comparable, even though the specific ways in which data was collected varied from one country to another in order to make it more locally relevant.

Data Analysis

The purpose of the data analysis particular to this paper was to identify and categorize trends in relation to user profiles of public access venues. We conducted different types of analysis:

We cross-checked the consistency of the data within and across different reports (summary, detailed report, narrative report, statistical profile), and when needed, verified the accuracy of

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[6]Document reviews: identified and reviewed salient literature in the country, including existing statistical information about population, ICT penetration, public access venues, government policies, and previous studies relevant to the study. On average, 30 to 50 documents per country were reviewed.

[7]Expert Interviews: identified at least ten specialists in the areas of interest of the project and conducted in-depth interviews with them. Interview guides were prepared in each country depending on the local needs and context. On average, 10 to 15 interviews with experts were conducted per country.

[8] Site visits: identified, visited, and observed six or more venues of each type (library, telecentre, cybercafé, or other). Site visits were undertaken for a minimum of a half day, making sure to include both urban and non-urban sites (ideally three of each). In selecting sites, research teams identified typical case samples of each type of venue, including both urban and non-urban sites. On average, there were 20 visits per country, and about 500 sites visited in total.

[9] User Surveys: user information was collected via a shared survey instrument. Each country team was allowed to add questions that they felt were relevant to the local context to enrich the overall body of evidence. At each site, every second or third user exiting the venue was surveyed. Teams surveyed between 40-50 users at each venue. Total users surveyed: 720-1100 per country. Given limited time and resources, user surveys were not intended to provide statistically significant samples of the population or of the venues studied, but an exploratory indication of trends and patterns for comparison and further research

[10] Operator Interviews: identified at least one operator in each site visited and held a structured interview to provide a more in-depth understanding of the venue, users and environment. Total operators interviewed: 18-22 per country.

[11] Additional optional data gathering: focus groups with users, operators or experts, additional visits and interviews, peer consultation and review.

data regarding counts of public libraries and other venues in different countries. We aggregated and analyzed the numerical data reported for the survey results in each country. In some cases where information was missing from the country reports we asked for additional input and clarification from our research partners. This numeric analysis is summarized and presented in the charts below, describing the distribution of the different types of public access venues, and the proportion of users by gender, age, education and income.

We also did a detailed coding of all qualitative data using variables from the ACE Framework for each type of venue; this interpretive coding of the qualtitative data was used to further understand the trends and patterns emerging in the numerical analysis of the data. Therefore, qualitative data is used to explain or illustrate the findings of the numerical analysis.

Finally, we undertook a detailed re-reading and discussion of the country reports to identify and group trends in the data and make sure we did not miss any significant insights from local research partners in relation to venue distribution, and in relation to gender, education, age and income of users. These are the main categories of findings we report in this paper.

Limitations of this Study

This study focused primarily on gathering qualitative data to assess the current state and future opportunities in public access to ICT across different types of venues in a sample of 25 countries. This study is groundbreaking in its breadth and scope in that no other studies have systematically looked at different types of public access venues and across multiple countries around the world. Nonetheless, the breadth of the study also means that this study does not provide an in-depth analysis of a particular venue, country or experience, and findings cannot be easily generalized without a clear understanding of the specific context and the analytic framework used. Furthermore, despite the different mechanisms to enhance the credibility and integrity of the data, research was particularly challenging in some countries as compared to others. Significant challenges were found due to country size and diversity in Brazil, Indonesia and South Africa; due to unexpected political turmoil in Georgia, and due to changes in the research teams in Malaysia, Indonesia and Dominican Republic.

The tension between structure and flexibility in research design generally helped to strengthen the research results by providing a common research design that allowed flexibility to adapt to

local priorities and context. The survey sample was not intended to be statistically representative but to provide a useful indication of trends. It was done using a common survey instrument, translated and adapted to meet the needs of each context. Survey results were mostly shared as percentages, not absolute numbers, and in some cases the scales for the answers were changed (for example, the age brackets to distinguish youth from adult), thus diminishing the ways in which we could analyze and use the survey results. While a common survey instrument was used across all countries, interview guides were prepared by each research team to respond to their particular needs and context in order to collect the information required. Even though all teams were seeking to answer the same types of questions about each venue, a pre-defined interview guide for fieldwork research was not enforced. This allowed for more flexibility to adapt to local context, but renders results that are more difficult to accurately compare.

Other numerical data such as counts of venues, percentages with ICT, and percentages in urban or non-urban settings generally come from secondary sources consulted by local researchers. Data about public libraries is generally more reliable than other venue data, as public records are kept by most countries and international bodies that work with libraries (i.e., IFLA, UNESCO); when available these official sources were used. Information about telecentres is more dispersed among international agencies and local non-profit organizations that sponsor them, making their records more difficult to access. Data about cybercafés is generally less comprehensive or not available at all. Information such as estimated number, characteristics and locations of cybercafés, and to a lesser degree, telecentres, tends to be an informed estimate, sometimes the result of "educated guesses" on the part of the researchers, based on what they learned about those particular venues and the context in the country. Consequently, there is much variability in available estimates about the number of venues, especially cybercafés. While in our study there are numbers that may appear to be too high (the number of cybercafés in Uganda, for example, is estimated at 20,000, a figure that sounds very high even though it was corroborated by the local research team), other numbers appear too low (for example, the number of non-urban telecentres in Colombia is reported as zero, when personal experience demonstrates the existence of successful rural telecentres in the country). Furthermore, estimates for number of cybercafés are missing in some other countries (no estimated numbers for cybercafés in Malaysia, Georgia or South Africa, for example, and we could not find independent and credible estimates elsewhere). This means that while the numerical details discussed here may not be an exact reflection of any

single country, and estimates about cybercafés in particular may be the most variable, they are based on locally-informed estimates and analysis which, when combined across all 25 countries represents a meaningful source of trends and patterns about users of public access ICT venues.

Finally, this study is focused on uses of ICT in public access venues: it does not include non-users, it does not include private uses of ICT (at home, work or school), and it does not include uses of other important communication technologies such as mobile phones or community radio.

FINDINGS AND DISCUSSION

In this paper we discuss the main findings in relation to the **users** of public access venues, particularly in relation to gender, age, education and income, as well as location (urban or non-urban[12]) of the venues. These are the key inequity variables we studied across all 25 countries, covering approximately 250,000 public access venues in total.

Distribution of Public Access Venues

Bearing in mind that the numerical data in our study offers a useful indication of trends but not of exact values, the next three figures describe the total distribution of public access venues included in this study, with proportions by type of venue and by geographic location (urban/non-urban):

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[12] There was much discussion with our research partners on the use of urban vs. rural, as each country has a different definition of what constitutes "rural", and there is always the issue of "peri-urban" locations… we have therefore simplified this by focusing on the urban and non-urban geographic distribution.

Distribution of public access venues

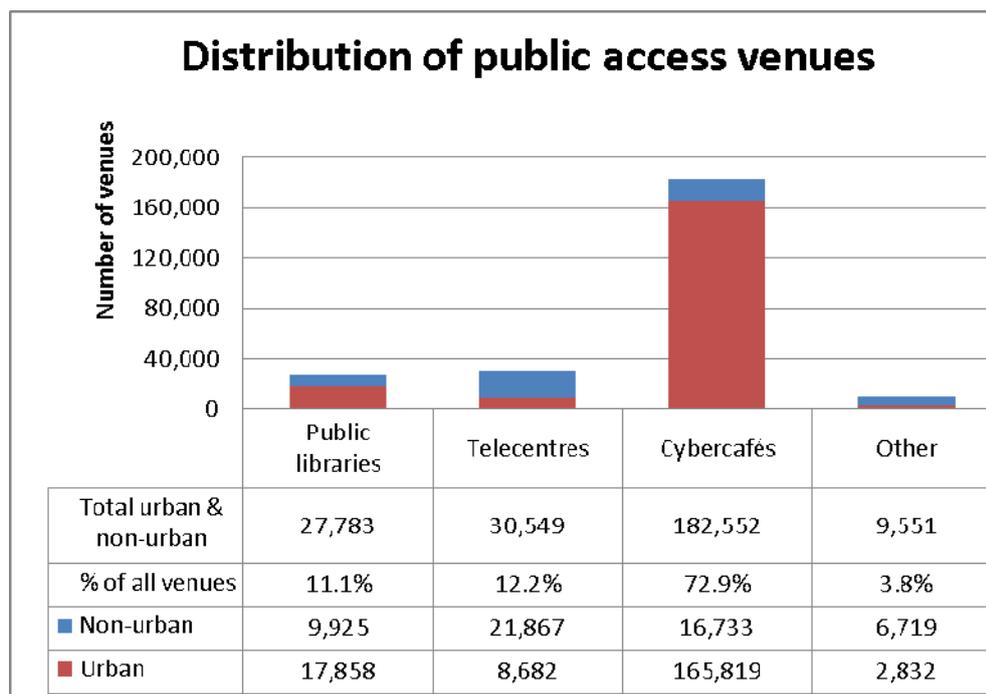|	Public libraries	Telecentres	Cybercafés	Other
Total urban & non-urban	27,783	30,549	182,552	9,551
% of all venues	11.1%	12.2%	72.9%	3.8%
■ **Non-urban**	9,925	21,867	16,733	6,719
■ **Urban**	17,858	8,682	165,819	2,832

Figure 1: Distribution of Public Access ICT Venues in all 25 Countries

Cybercafés are by far the most common type of public access venue, representing 73% of the total number of venues included in this study. Libraries and telecentres account for only 11% and 12% (respectively) of the total count of public access venues, and other venues account for only 4% of the total. Four countries (Georgia, Honduras, Malaysia and South Africa) did not report any numbers for cybercafés, and seven more countries reported numbers for cybercafés that are lower than other types of venues (Bangladesh, Dominican Republic, Kazakhstan, Moldova, Mongolia, Namibia and Sri Lanka). Based on the descriptions offered in the country reports, these low numbers can be attributed to strong public access initiatives leading to other types of public access venues, as in the case of Sri Lanka (Wanasundera, 2008) and Namibia (James and Louw, 2008). See also Francisco Proenza's work on for a detailed discussion of urban bias of public access initiatives (Proenza, 2006). Furthermore, the Dominican Republic in particular mentions a lack of official data for their venue counts, which may lead to an underestimation of number of cybercafés (Alfaro et al., 2008). In any case, the field of cybercafés is probably the most understudied, and these numbers are most likely to grow.

A clear concentration of public access venues is located in urban areas. While telecentres and "other" venues have a high proportion of non-urban locations, public libraries and cybercafés are

primarily urban, with 64% and 91% of them respectively in urban locations. Furthermore, only 31% of the public libraries, on average, offer ICT as part of their services. The numbers for urban and non-urban locations are erratic, but tend to be skewed toward urban locations. Given that cybercafés account for 73% of all public access venues studied (the great majority of them are urban), and given that over half the public libraries are urban, with only about 31% of the total libraries offering ICT services, it is clear that public access to ICT is mostly an urban phenomenon. With a concentration on urban areas and populations, public access to ICT for the most part fails to serve the majority of the rural populations in the countries studied. The urban/non-urban divide is by far the most significant divide in public access to ICT.

More detailed country by country charts based on these data are available as CIS Working Paper no. 7 (Gomez, 2009a). While data about number of public libraries and, to a lesser extent, telecentres is relatively easy to gather, the number of cybercafés is difficult to determine in any given country. Cybercafés are generally not grouped under any collective body or association, and they tend to appear and disappear with the local economy and market needs; their numbers are the result of "informed speculation" and may well be exaggerated for some countries while it is missing in others, as discussed earlier. In Georgia, Indonesia and Malaysia we have estimated the proportion of public libraries in urban locations, and in Brazil, Costa Rica, Ecuador and Uganda we estimated the proportion of cybercafés in urban locations, based on information in the reports, since no actual numbers were provided by the country teams. On the other hand, countries like Colombia report there are no rural telecentres, when we know they do exist but were not studied. Namibia includes Schoolnet and South Africa includes HIV/Aid Centers as "other venues", and in both cases they have a high proportion of venues in rural locations, which helps to explain the low urban bias of "other" venues, even though their overall significance is diminished given the low proportion of "other" venues (less than 4%) in the public access landscape. In conclusion, these exceptions do not change the general trend we confirm in our study: **cybercafés constitute the largest source of public access to ICT, and the majority of public access venues are located in urban areas**.

This finding has two main implications:

1. There is an extreme **urban bias** in public access initiatives. This urban bias has been reported before and is noted as a failure of telecentres and kiosks to serve rural

populations, which constitute the majority of public access venues in many developing countries (Proenza, 2006, Kuriyan and Toyama, 2007). If public access to ICT is to make a meaningful difference for underserved populations, the urban bias of current public access initiatives needs to be addressed, strengthening initiatives that offer public access to ICT in rural locations.

2. The **importance of cybercafés** in the field of ICT for community development has previously been reported by others (Haseloff, 2005), even if it is an "unintentional" social role (Finquelievich and Prince, 2007); an "instrumental" one (Robinson, 2006), or an expression of the "public sphere"(Salvador et al., 2005). Even though there has been far more research about telecentres and public libraries than cybercafés, the sheer number of cybercafés makes it clear that their role in community development needs to be better understood in order to take full advantage of the increased access to ICT that they offer to the public. Furthermore, rather than competing with cybercafés by setting up new or alternative public access venues, government policy and public funds could be better directed to help make ICT services offered by cybercafés more equitable, accessible and relevant to underserved populations (gender, age, education, income, as discussed below, as well as language, ethnicity, religion, caste and other inequity variables of importance in each particular setting).

In this context of urban bias and strong predominance of cybercafés in the public access landscape, a closer look at the overall trends among the users of the different types of venues follows. While other work in progress based on this study, and other ongoing studies at the University of Washington and elsewhere offer further insight into gender, education, income and age as important dimensions of use of public access venues, more research is needed to ascertain the more complex nature of the issues here discussed.

Smaller Gender Differences

Past experience and studies of public access venues (see detailed literature review by Sey & Fellows,(2009)), especially studies of telecentres (APC WNSP, 2005); (APC WNSP, 2009); (Abbasi, 2007, Obayelu and Ogunlade, 2006, Gurumurthy, 2004); indicate a significant gender gap in public access venues, reportedly visited and used primarily by men. However, as shown in the following figure, our study shows that overall trends in the proportions of users of the

different types of public access venues tend to be quite similar among men and women around the world, with small differences that we will discuss in detail. As indicated earlier, given the limited sample and the variances in the reports across countries, the significance of these findings is not statistical in nature, but an indication of general trends.
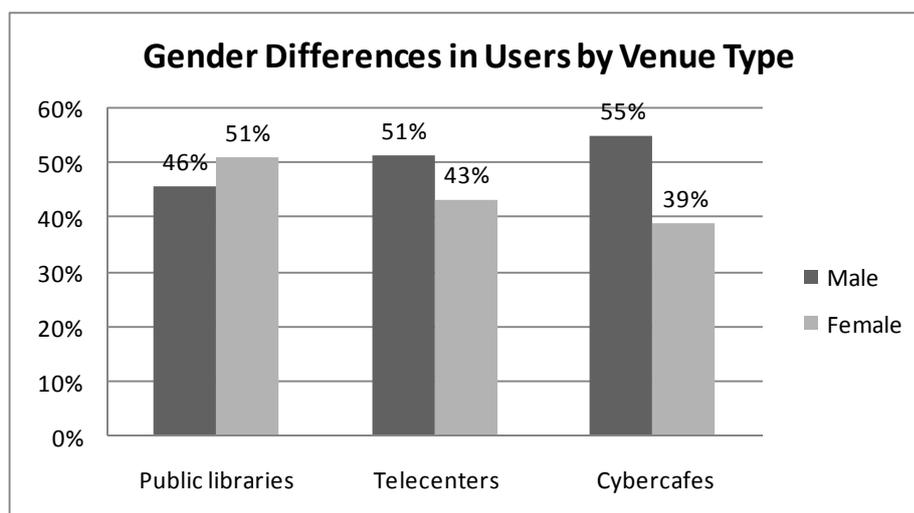

Figure 2: Gender Differences in Users by Venue Type

Public libraries appear to have the smallest difference in gender distribution of users, with a slightly higher proportion of women visiting libraries than men (Agosto et al., 2007, Applegate, 2008). Telecentres and cybercafés, on the other hand, tend to be visited more frequently by men than women. While the gender difference is smaller in the case of telecentres, in the case of cybercafés the difference may be more important (9 and 16 percentage points, respectively). This data confirms the notion that access gaps still exist with regard to gender, but clearly, all of the public access venues we surveyed were being used by women, and their use is not insignificant.

In a review of an earlier version of this paper, Francisco Proenza rightly noted that the apparent gender balance does not take into consideration the fact that 1) cybercafés are far more numerous than other venues (even if they are exaggerated), and 2) public access venues are more concentrated in urban settings. Our data is not robust enough to analyze the urban/non-urban divide and how it relates to gender or other variables among users, but if we take into consideration the relative weight of the number of cybercafés vs. the number of libraries and

telecentres, the gender difference in use of public access venues becomes more significant. This is displayed in the following figure:
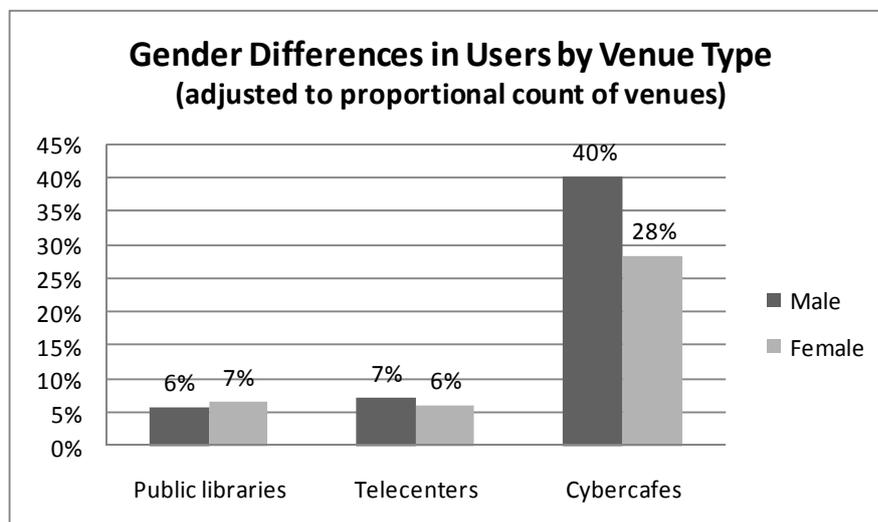

Gender Differences in Users by Venue Type
(adjusted to proportional count of venues)

Figure 3: Gender Differences in Users by Venue Type (adjusted to proportional count of venues)

If we weigh the gender distribution of the users in relation to the number of venues in each type, the difference between men and women using cybercafés becomes clearer, given the fact that there are far more cybercafés than other types of venues: taking into account the numerical predominance of cybercafés, the gender difference in use of cybercafés appears to be more significant. At the same time, this reading of the data also minimizes the gender disparity among users of libraries and telecentres, emphasizing the gender equity of the use of libraries and telecentres as public access venues.

This trend could reinforce the idea that public access initiatives that explicitly address and correct social inequities and gender differences, as is most frequently the case in public libraries and telecentres, are more successful at transforming the gender imbalance. But this gender imbalance remains untouched or is further exacerbated by initiatives that only provide access to technology, as is the case of cybercafés. More in-depth research in each particular context is needed to assess a) whether the gender imbalance is larger or smaller than what our findings seem to imply, b) whether this difference is the result of numerical distortion in the count of venues, and c) whether it represents evidence that gender equity can be enhanced through purposeful social intervention (i.e., programs specifically designed to encourage participation of

women) or undermined by public access that is limited to providing access to ICT alone, left to reflect existing inequities in society and driven by market forces.

Evidently, the number of users does not give the full picture of the public access venues: the frequency, intensity, purpose and results of the use of ICT in public access venues is also important. For example, women face significant social restrictions in numerous countries, especially in some Muslim or Hindu countries, where it is socially unacceptable for women to be alone or without a male in public places, or it is not acceptable for women to interact with male operators of public access venues. This is illustrated by an example from Egypt, where: "…local cultures also sometimes affect the people's access to public access venues. Among these is the factor of gender, which in some communities limits the access of women. Cyber cafés, as an example, witness a limited number of female users, more so in rural areas. While this is not as extreme in other venues, there is a limitation on the suitable hours for females to access these venues" (Wanas, 2008).

These may be stronger barriers for women to use public access venues than just "no free time" or "no training in technology". Recent research in India and Chile by Kuriyan and Kitner (2009) offer additional valuable insight into issues of gender and shared computing. Gender interactions in public access ICT warrants further investigation, and tools such as the Gender Evaluation Methodology (GEM) developed by the Association for Progressive Communications (APC) (APC WNSP, 2005, APC WNSP, 2009, Goldfarb and Prince, 2008) would be useful to shed additional light on this topic.

Significant Age Differences: primarily used by youth

The most commonly reported result of all research teams around the world, and across all three types of public access venues surveyed--libraries, telecentres and cybercafés—was that age is the most significant defining characteristic of the populations using these venues. Public access ICT venues are frequented mostly by youth. As clearly stated by the Argentina research team, *Gender is not as relevant as age regarding the use of the information venues* (Rozengardt and Finquelievich, 2008).

The following figure shows that the overwhelming majority of visitors to all three venues is between 15 and 35 years of age. While it would have been preferable to have a finer filter in the

age brackets, for example an age bracket between 15 and 24, and another between 25 and 35, variations in the scales used in different countries make it impossible to clearly differentiate age brackets between 15 and 35. The percentage of "senior" visitors aged 61 and older is the lowest of all age groups in all venues.
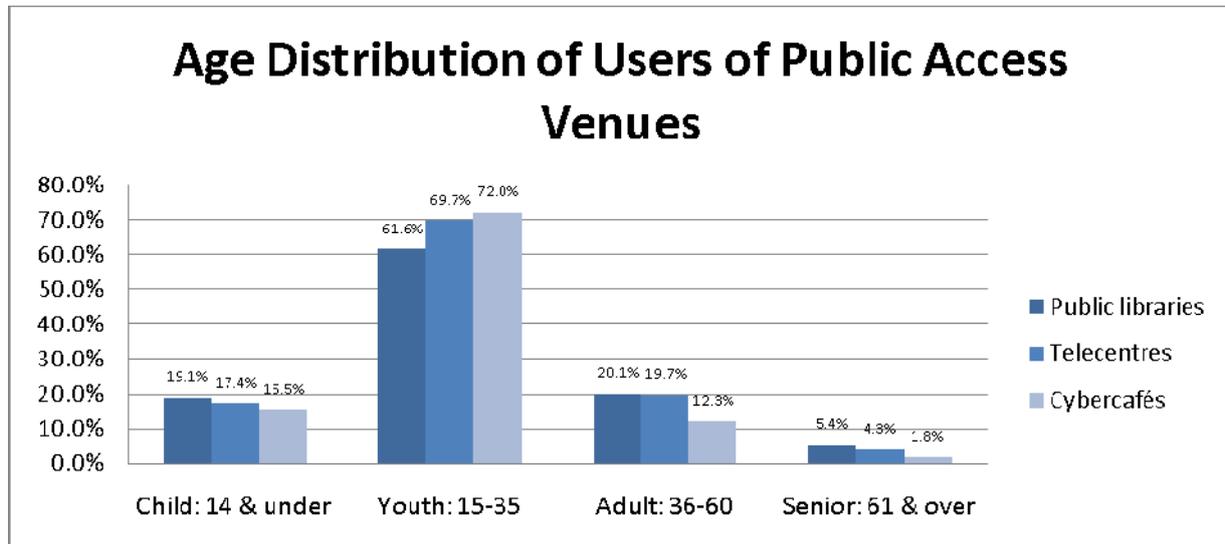

Figure 4: Age Distribution of Users of Public Access Venues

It has frequently been said that youth are "naturally close" to technologies and that older populations are more removed: for example, in studies of populations over 60 years of age in developed countries (Raban and Brynin, 2006) older populations are shown to use ICTs very little. However, in this same study the authors postulate that perhaps much of the relationship between age and technology use has to do with "secondary factors that are associated with age, such as reduced employment, diminished resources, and lower level of education." (Raban and Brynin, 2006). Anecdotal evidence in our study suggests that seniors may be slightly more prone to use public libraries due to familiarity with the venue, but their use is still very reduced compared to people of other age groups.

The concentration of users around youth, even largely defined as between 15-35 years of age, is clear across all types of venues and across all countries. There is little or no variation in the trend shown in the figure above when separating urban and non-urban venues except for a slightly higher proportion of adult users in the small number of available non-urban public libraries and telecentres. Furthermore, there are very few countries where there is a remarkable difference in

the age distributions of the users from the averages shown above. More research in each country would be required to explain or correct the following extreme variations from the average:

Significantly higher than average

Honduras shows an unusually high proportion of children (ages 14 and under) using public libraries, and Dominican Republic shows an unusually high proportion of children using telecentres. While anecdotal evidence would suggest a high concentration of school children using libraries and telecentres in these countries, it is more likely that the apparent extreme variations in these two countries are due to measurement error, since they both also report lower than average use of these venues for the youth age group, suggesting that the scale used to differentiate children from youth might have been different in these countries.

At the same time, Kazakhstan, Kyrgyzstan and Namibia all show unusually higher proportions of youth using public libraries, and Honduras and Kazakhstan show unusually higher proportions of youth using telecentres. It is possible that these extreme variations are due to measurement errors in each country, since it is unlikely that all or almost all users of any age group would be exclusive users of any particular type of venue, as the data would seem to suggest. Finally, Peru and Mongolia both show a higher than average use of telecentres among adults, but we cannot find any apparent reason for this variation.

Significantly lower than average:

Few countries show a significantly lower proportion of youth using the public access venues: Costa Rica reports a low proportion of youth using telecentres; Dominican Republic reports much lower than average youth use of all venues; and Georgia and Honduras both report a relatively lower proportion of youth using public libraries. On the other hand, Peru reports an unusually low proportion of adult users of public libraries. As discussed above, the cases of Honduras and Dominican Republic may be attributed to errors in measurement; there is no obvious explanation for the variations in Costa Rica, Georgia and Peru; further research is needed to assess whether they too are measurement errors, or there are specific circumstances in those countries that explain this type of user distribution.

Finally, given the higher number of cybercafés over other types of venues we created a projection of users by age that is proportional to the number of venues of each type. The result of

this adjustment for age reconfirms the previously highlighted trend of youth as primary users of public access venues, emphasizing a stronger preference for cybercafés over other types of venues among youth, and eliminating a very slight preference for libraries over other venues among children, adults and seniors, as is apparent in the analysis described above. Nonetheless, the differences are small enough not to warrant a solid conclusion. We have already indicated that the nature of the numerical data makes our analysis useful to identify higher level trends, but not useful to explain small differences in each particular context.

The case of Ecuador appears to be a very typical illustration of the age distribution of users of the three types of public access venues, as described by the local research team:

Libraries: "Library users are mainly young students (around 70% with education level up to high school), 79% between 15-35 in urban areas and 83% in the same range in non-urban areas. Most of the users are from medium [income bracket]" (Bossio and Sotomayor, 2008).

Telecentres: "Young people between 15-35 years old are most of the users of telecentres in urban areas; in non-urban areas users are mostly distributed by age (50% under 14, 17% 15-35 and 33% older than 35). People older than 61 are not telecentre users" (Bossio and Sotomayor, 2008).

Cybercafés: "Young people between 15-35 years old use cybercafés; this segment usually are incorporated to labor market, so they can afford the cost of services… In non-urban areas a significant (36%) [number of] users are under 15 years old, and their use of cybercafés is mainly for education purposes because they usually don´t have other sources of information. In urban areas highly educated populations[are the] main users of cybercafés (70% with university degrees)" (Bossio, 2004, Bossio and Sotomayor, 2008).

The fact that information needs can also be met at the workplace (a phone in the shop or a computer at work) could indicate that adults do not use ICT less than youth, they just use public access venues less because they find other ways to access it at work or even at home. As we will see, the same logic applies when discussing income differences. More research into the interaction between ICT use in public and private access venues.

Education differences: focus on students and users with formal educations

Results of our study show that, overall, most users of public access venues have high school or college educations, while a smaller proportion of them have elementary educations, and only a small fraction has no formal education at all. Our study shows that the majority of ICT users in public access venues is students, especially young students, across all types of public access venues.

Presented in a visual manner, the figure below emphasizes when looking at education levels, a pattern emerges in which the smallest user group of public access venues have no formal education at all, and the proportion of users grows as level of education goes up, reaching its maximum with high school education levels. The proportion of users with college level education then drops again, but it is still higher than for those with elementary education only. This pattern is consistent across all venue types (libraries, telecentres, cybercafés), and also across geographic locations (urban and non-urban venues), except for a slightly higher proportion of elementary education level usage in non-urban locations than in urban ones. One limitation of the data presented here is that for most countries it is difficult to know whether the education level is current level (students actively enrolled in education at that level) or maximum level reached. Bearing in mind the predominantly young age of the majority of users described above and on anecdotal evidence, we are inclined to think that the majority of users surveyed are youth currently enrolled in school at the level indicated here, and not that they are adults who record this as the highest level of education reached.
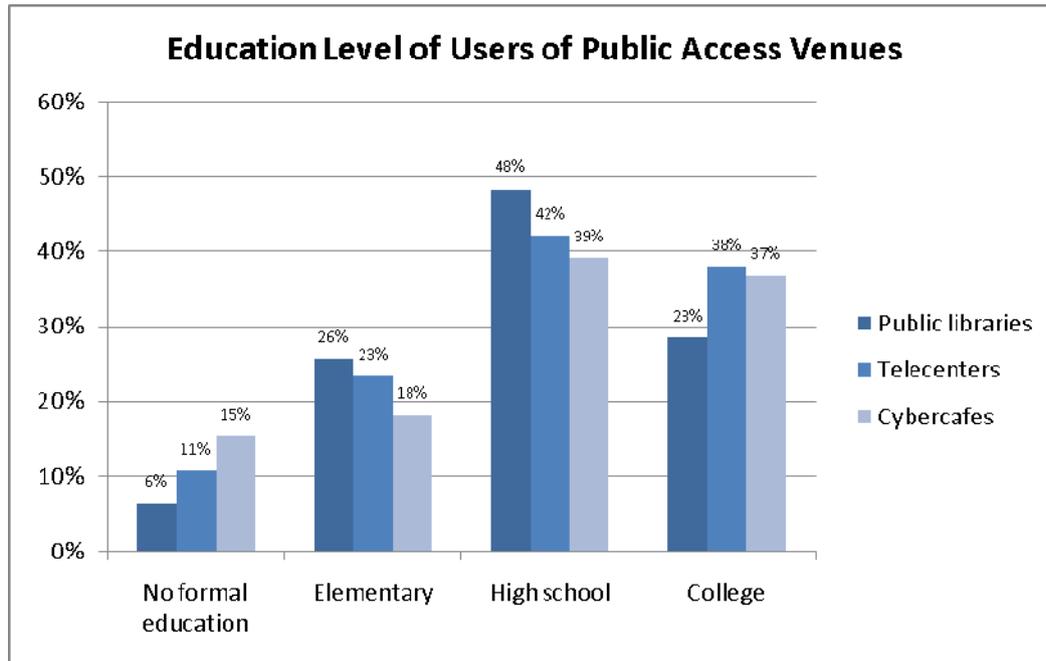
Figure 5: Education Levels of Users of Public Access Venues

Few countries have a significant variation from this general trend: Egypt reports 80% of users of public libraries are in elementary school, and Moldova reports almost half the users of telecentres and cybercafés have no formal education. Kazakhstan reports unusually high percentages of college-level users in all venues. We have no particular explanation for these variations from the general trends, and further research in these countries would be needed to assess what lies behind them.

Most of the research teams around the world described education as being the primary use for public access information venues: these spaces are being visited mainly by young men and women doing their studies, primarily at the high school level. People with little or no formal education don't appear to be visiting these venues as frequently. This fact was expressed well by our Sri Lanka research team: "There are large numbers of people who are illiterate, who have no basic education, and are school drop outs. Very few of these people will use public access information venues" (Wanasundera, 2008).

The figure above indicates a predominance of library use by elementary and high school level users. Nonetheless, this does not necessarily mean they are making use of the public access venues to actually fulfill their school-related information needs or not. Information needs and uses are analyzed in a separate paper in progress. Furthermore, While an important feature of

public access venues is to fulfill the information needs of school-aged children and youth, most of whom are enrolled or have completed elementary, high school or college level education, the apparent preference for libraries among elementary and high school students is erased when we factor in the relative weight of each type of venue: there are three times as many cybercafés as there are telecentres and public libraries combined. Based on the data on user age and education level alone makes it difficult to confirm whether libraries and telecentres would be used more for education related activities and cybercafés less, as the numerical data above would imply. But other qualitative data collected in the study does confirm the importance of education uses across all three venues. The following are typical examples of narrative descriptions made by local research teams about the education-related information needs of users:

Libraries: In Honduras, for example, "people access every day, the majority being kids and young people in school and university students…. Although the community has free access to the libraries, the adult population is the group who less visits them…. Students are the ones who consider it not only useful but necessary. But reading, information and knowledge as a way to improve the quality of lifestyle are still not as widespread amongst the rest of the community" (Arias and Camacho Jiménez, 2008).

Telecentres: In the Philippines, for example, where telecentres are called Community E-Centers, "the users belong to the low- to medium-income range and possess intermediate education. They are below 25-years-old and live in rural areas… These students take the most advantage of accessing information through ICT while women, farm workers, the elderly and other underserved may have some difficulty finding time to access. (Ideacorp, 2008).

Cybercafés: In Kyrgyzstan, for example, where cybercafés are called Internet Clubs, "the majority of the users at Internet Clubs are students and school children. They usually look for thesis or dissertation references or subjects they are studying for their course work or thesis. In addition, students and school children come to Internet clubs to print out their presentations." (Ariunaa, 2008).

While there is some evidence supporting an important education-related use of all types of public access venues, especially at the high school level, it is clear that people with no formal education are for the most part not using public access venues. This points to an important social equity gap in the use of public access venues, especially challenging to the social role of public libraries and

telecentres: how can they better include and serve the sectors of the population that are currently being excluded, those who do not have any formal education? More research into the education level and education uses of public access venues is needed to understand this issue in more depth.

Income differences: public access makes ICT available to lower income population

The last inequity variable for which we collected information in all countries is income level of the users of public access venues. Findings in relation to this variable appear to confirm that public access venues around the world are accessed primarily by low- and medium-income individuals (low, medium and high income brackets were determined relative to the specific context in each location, not to a set dollar value). There is less use of public access venues by people with higher incomes, especially of public libraries, as the following figure indicates:
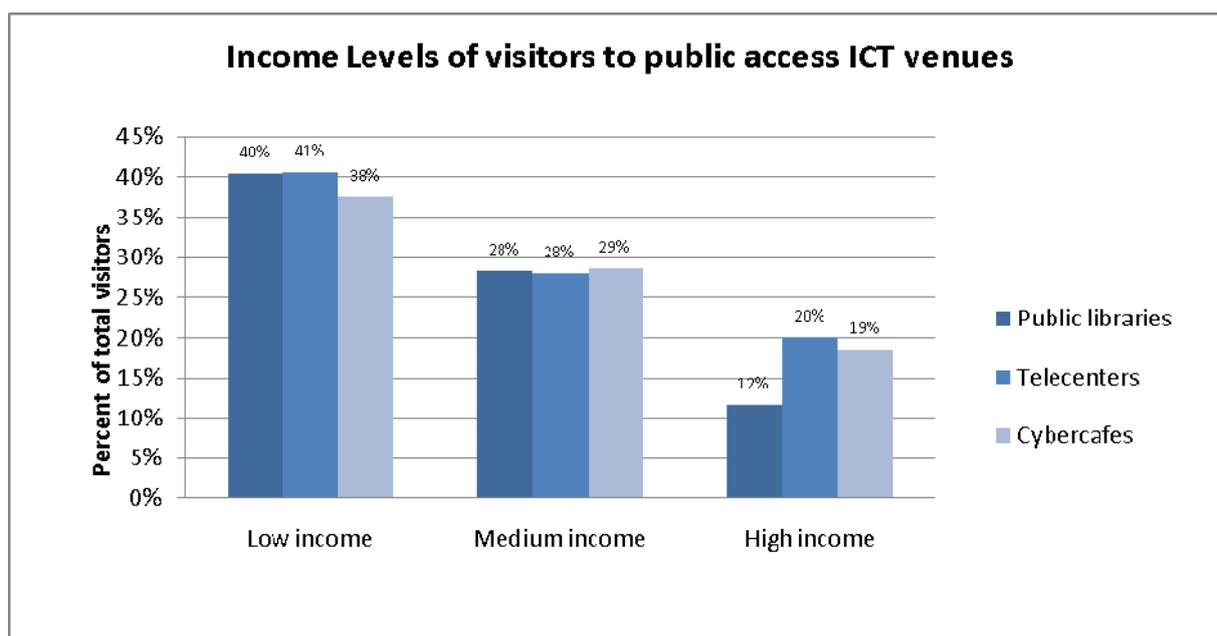

Figure 6: Income levels of users of public access ICT venues

These results seem to support the idea that public access venues *do* make a difference in making ICT more accessible to lower and middle income populations, where private ownership and use do not support these needs.

Telecentres and cybercafés generally charge a fee for their services, so an interesting observation from the above figure is that there is not a large difference between low and middle income

groups in their use of free public libraries versus fee-based cybercafés and telecentres (a small proportion of telecentres offer services for free; most charge some kind of fee for service, even if it is very low or subsidized and does not help to cover all the expenses of operating the telecentres). One might expect the differences in the patterns of use to be larger if cost was an important driving factor to determine choice of venues. These results do not strongly support the idea that public access services need to be *free* in order to be accessible to lower or medium income populations. Factors other than cost seem to be equally or more determinant in people's choice of which public access venue to visit. In other words, while defining the precise reason for income-related variations in public access to ICT is not possible with the data we have, the observations provided by our research teams seem to indicate that charging a fee is not necessarily an important obstacle to accessing information in public access venues.

The situation described by Brazil seems to be fairly typical, not exceptional: "poorer people were more likely to use cybercafés than their rich counterparts. Among internet users earning less than the minimum wage, 78% declared they access the web through paid public access centers. By contrast, only 30% of those who earned more than five times the minimum wage relied on cybercafés." (Voelcker, 2008).

Aside from cost, populations also value other aspects of public access venues, such as the services they provide and the array of resources available. Our Nepal researchers, for instance, pointed out that low income groups could not afford the services of telecentres and cybercafés, but they also viewed these venues as being unimportant. At the same time, these researchers observed that high-income groups didn't need to come to cybercafés to get their work done, the obvious reason being that they most likely have computers and Internet connection at home or at work (South Asia Partnership (SAP International), 2008).

This is an important issue to explore further, especially in the face of increasing difficulties for financial sustainability of public access ICT services. Based on the preliminary information, public libraries (which generally offer ICT access for free) and telecentres (which are sometimes free but frequently charge low fees) could improve the financial sustainability of their ICT services by charging user fees without significantly altering the use of their ICT services: People of similar income brackets appear to make comparable use of different types of public access

venues, ***regardless of fees***, and use of public access venues seems to decrease as income bracket increases.

Finally, these findings confirm the notion that use of public access venues is not necessarily restricted to lower or middle income populations, although they do constitute the majority. In conversation with research partners it was reported that public access venues are also used by people who have private access at home, at work or at school: convenience, speed or socializing with friends were strong drivers to use public access venues. The case of Peru is unique in that there is an unusually high proportion of Internet access in the country that happens through Cabinas Publicas, the local version of cybercafés, as opposed to through private access at home or work. The history of internet penetration in the country and the early spread of Cabinas Publicas might explain this unusual trend, which is not replicated in any other country in the study. Additional research on whether higher income populations tend to use ICT less in public access venues because they use it at home, at work or elsewhere is warranted.

CONCLUSIONS

This study shows that the typical profile of users of ICTs in a public access venue—a library, telecentre, or a cybercafé— in the countries we studied, is very likely to be in an urban location, and very likely to be young (15-35), low- to middle-income, and with high school or college education. Overall, users are equally likely to be male or female (although a majority of users of cybercafés appears to be male, and some differences do exist in particular countries and particular venues). This typical profile highlights the notion that public access venues are serving people who are already benefiting from other social services, especially formal education. In sum, public access venues are not serving the poorest and most marginalized and excluded sectors of society.

The most salient divide revealed in our study is not based on gender, age, education or income, but based on geographic location: public access venues are predominantly located in **urban** centers, and non-urban areas are dramatically underserved, with very few exceptions. Reaching rural populations with public access to ICT is a far more difficult and costly task than reaching urban populations, but it is a task that governments, development agencies and donors will have to address if they are to make further progress in overcoming the digital divide.

If the driving force behind funding public access venues with the intent of contributing to social development, reaching underserved communities and closing digital divides, as tends to be the case in public libraries and telecentres, this goal is partially being met: lower and middle income users are being served, women appear to be served as much as men, and children and youth appear to be the strongest users of these venues (adults and seniors far less so), and they are serving the information needs of students. An important finding of this study is that while public libraries and telecentres are serving this need well, cybercafés appear to do it as well in urban areas of most countries. In addition, cybercafés and much stronger players in the public access landscape, with more numerous facilities in operation in urban areas, and with similar patterns of users in regard to age, gender, education and income (even though men appear to be more frequent users of cybercafés than women in most contexts). Even with their strong urban bias, the potential role of cybercafés in social inclusion has been studied very little, and opportunities for partnerships and collaboration between public libraries, telecentres and cybercafés have rarely been explored. Results of this study emphasize the need for creative solutions to harness the potential offered by cybercafés in urban areas, and to look for ways (policies, partnerships, incentives) to make them more accessible and useful to adults and seniors, to women, to lower income users, to those with no formal education, in sum, to those marginalized and excluded from goods and services in society. Other exclusion factors are likely to include language, ethnicity, religion, caste, etc. which should be equally addressed in each particular context to make public access to ICT more truly equitable.

The patterns revealed here in relation to users do not say much about what people are actually doing in the public access venues, how this use differs by age, gender, education or income, and how it differs by type of venue. We are preparing a separate analysis of this matter in other ongoing work as part of this same study, but more research is certainly needed to uncover the nuances and complexities of the actual uses of public access venues. Furthermore, our study does not look at private use of ICT (at home, work or school) or at the interactions with other communication technology (mobile phones, community radio). More research is needed to better understand these spaces and their implications for public access ICT for community development.

We cannot make detailed country-level conclusions based on this comparative analysis, and the small differences in the numbers reported here are not necessarily statistically significant. Nonetheless, we can see broad patterns that suggest interesting questions for further research:

What can be done to improve access and broaden inclusion for truly underserved populations (such as low-education groups, very poor, and the elderly)? The predominance of young users with formal education suggests that just providing public access ICT does not necessarily result in further inclusion of marginalized sectors of the population. The sole provision of public access to ICT, without additional training and outreach to include people marginalized from social and economic goods and services, may not significantly transform inequitable relations and distribution of resources in the communities they serve. For example, the existing divide between urban and non-urban communities is magnified through the urban bias of public access venues, and the predominance of youth seems to be strengthening a new age divide, one that is permeating other sectors of life as well. Those already excluded from formal education are further excluded from public access venues, and it is likely that the poorest sectors of society are also being excluded. Providing access alone does not automatically result in stronger inclusion of marginalized and underserved populations. Other factors such as ethnicity, religion, caste or language are not included in this study for lack of comparable data, but should be explored further as well.

The high youth participation rates are intriguing. What are the social dynamics in these spaces? How are they configured as social spaces for interaction, both online and offline? Perhaps we should think in terms of how the technology enthusiasm of young users could be captured to benefit communities? How will the knowledge production processes of young people (influenced by new communication and information processes) affect how communities and countries operate?

More in-depth studies in each country and in each type of public access venue are needed to further understand the profiles of users, their uses of public access venues, and their implications for digital and social inclusion.

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