

## Research Article

# Users' Perceptions of the Impact of Public Access Computing in Colombia: Libraries, Telecenters, and Cybercafés<sup>1</sup>

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### Abstract

*Measuring the impact of information and communication technologies (ICT) for community development is critical, yet it remains elusive. This article presents findings from an exploratory study of public access computing (PAC) services in Colombia, South America, conducted by University of Washington researchers and local partners. Using both qualitative and quantitative methods, the study explores perceptions of the impact of ICT on people's lives from the perspective of users of libraries, telecenters, and cybercafés around the country. Understanding the broader dimension of PAC services, instead of focusing on only a single type of venue (i.e., only libraries, telecenters, or cybercafés), offers a more complete picture of both how people use PAC and the types of benefits they derive from PAC services. Four types of perceived benefits emerge in the study: increased information, stronger relationships, better learning opportunities, and easier transactions. In addition, some negative consequences are identified. Findings question the notion that PAC has a direct impact on development by offering access to jobs, agriculture, health, employment, or other development resources. Rather, we suggest that PAC can have an indirect contribution to development by offering users benefits, such as easier access to more information and communication resources, better social connections with friends and family, and increased opportunities for education and learning.*

### Introduction

Information and communication technologies (ICT) have great potential to contribute to community development, especially for local communities, the underserved, and marginalized populations (Unwin, 2009; Warschauer, 2003). Nonetheless, inequalities in access to ICT, also collectively called the "digital divide," are a reflection of existing social, political, and economic divides in society; access to ICT alone does not change the relationships of inequality in society. In Toyama's words, "technology—no matter how well designed—is only a *magnifier of human intent and capacity*. It is not a substitute" (Toyama, 2010, original emphasis). Equitable access, effective use, and social appropriation of ICTs are needed if they are to become tools that contribute to community development.

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1. This research was conducted at the University of Washington Information School, in partnership with Icesi University (Cali) and Fundación Colombia Multicolor (Bogotá), Colombia. The author acknowledges the valuable contributions from graduate students Luis Baron, Phil Fawcett, Joel Turner, Monica Barba, Sarah Caldwell, Patty Northman, and Carlos Chavez in data coding, analysis, and comments on early drafts of this article.

## USERS' PERCEPTIONS OF THE IMPACT OF PUBLIC ACCESS COMPUTING IN COLOMBIA

People in marginalized and underserved communities in developing countries frequently lack the means to purchase and maintain their own computers and Internet access. To serve broader sectors of the population, government and nongovernmental initiatives for digital inclusion have set up public access computing (PAC) programs, such as initiatives to put computers in libraries or community telecenters (nonprofit venues that offer computer access as a contribution to community development). In addition, Internet cafés or cybercafés (for-profit businesses that offer public access computing and other related ICT services) are increasingly common in developing countries. Even though cybercafés are not primarily intended to serve development goals, they can also make unintended contributions to social and economic development. These three types of venues have unique features, as well as shared characteristics, that contribute to PAC services in the country. There are differences in the location, fees, services, and goals of each type of venue, and users have a choice among them. This paper explores the following questions: What are the users' perceptions of impacts, both positive and negative, of PAC initiatives in the country? How do these venues contribute to community development?

Many researchers have studied telecenters for development, some have studied computers in libraries in developing countries, and a few have studied cybercafés and their contributions to community development. Very few have studied the whole offering of PAC services, including libraries, telecenters, and cybercafés. Furthermore, there was a period of euphoria about ICT and telecenters around the turn of the 21st century, followed by much cynicism after the realization that it was difficult to assess PAC's impact on development. Such tangible impacts as improved jobs, income, health, and education have been elusive, and it is difficult to establish ICT interventions or PAC as their cause. In the last few years, some have dismissed PAC and euphorically embraced mobile phones as a new panacea for development (Heeks, 2009). Rather than dismissing PAC to seek a new holy grail

in mobile phones, we suggest reframing the expectations of the contributions of PAC to community development by establishing a better understanding of their potential benefits, from the users' perspective.

In 2008–2010, we conducted a large study of the landscape of PAC in 25 developing countries around the world (Gomez, 2012).<sup>2</sup> That study showed the importance of looking at the whole ecosystem of PAC initiatives, analyzing libraries, telecenters, and cybercafés in terms of equitable access, human capacity, information relevance, and policy environment. Colombia was one of the countries included in that study, and the landscape of PAC was found to be fairly typical compared to the other countries in Latin America and around the world, except for two unique features: 1) Colombia is one of only two countries in that study (South Africa is the other) with a strong, dual system of telecenters, including some set up by government agencies and others by nonprofit organizations. In the case of Colombia, they are both operating with some degree of success, and they collaborate with each other in many parts of the country. 2) Colombian libraries appear to be uniquely strong, as they have twice received an international award from the Gates Foundation (Access to Learning Awards<sup>3</sup> for Bogota in 2002 and Medellin in 2002); nonetheless, the success of these libraries in large cities has yet to reach the rest of the country, where only about 16% of libraries in the country offer PAC (this percentage is very close to the overall average of 14% for all 25 countries). The Colombia component of the Landscape Study was the least detailed of the 25 countries investigated.<sup>4</sup> We therefore conducted additional fieldwork in 2010 to complement the earlier findings. In this study, in addition to collecting more detailed data on the landscape of PAC in the country, we included an exploration of the perceived impact of PAC among users. Bearing in mind the particularities of the Colombian PAC landscape mentioned above, findings from this in-depth study can be used as a point of reference to understand, com-

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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, and Uganda.*

3. <http://www.gatesfoundation.org/ATLA>

4. *All detailed country reports are publicly available at <http://faculty.washington.edu/rgomez/projects/landscape>*

pare, and contrast the uses and impacts of PAC in other developing countries.<sup>5</sup>

To study PAC services in Colombia and understand their perceived benefits from the perspective of the users, we conducted fieldwork using both qualitative and quantitative methods in libraries, telecenters, and cybercafés in different towns and cities of the country during the first half of 2010. The intent was to better understand barriers, opportunities, and impacts of PAC for the social and economic development of Colombia's underserved communities. These findings represent user experiences and perceptions in different kinds of PAC venues around the country. The findings also offer insight into the kinds of benefits (and negative consequences) that users perceive to be most significant to them. Through a better understanding of the PAC services and the way users perceive the benefits they derive from them, these findings can inform PAC policy and program implementation in order to contribute more effectively to social and economic development of underserved communities, both in Colombia and in other developing countries around the world.

## Background

A dozen years ago, there were only a few PAC experiences around the world, mostly limited to a small number of international donor-funded "multi-purpose community telecenters (MCT)," notably in Uganda and Mali; a few "civic telecenters" precariously operating in schools and libraries in different countries; a few "basic telecenters" set up by local nongovernmental organizations (NGOs); a couple of "telecenter franchises," centrally coordinated but locally owned telecenters, as in South Africa and Peru; and a handful of cybercafés in wealthy neighborhoods and shopping malls of many capital cities and tourist towns. In only 12 years, these few, early PAC experiences have multiplied and spread around the developing world, sponsored by development agencies, governments, and nonprofit organizations. Privately owned cybercafés, run as for-profit businesses, have grown even faster.

The global interest in telecenters by development agencies and scholars grew dramatically with the turn of the century: Numerous articles related to

telecenters for development appeared in peer-reviewed journals, institutional reports, and other publications early in the decade (some of the most often cited such articles include Benjamin, 2001; Etta & Parvyn-Wamahiu, 2003; Gomez & Hunt, 1999; Proenza, Bastidas-Buch, & Montero, 2002; Roman, 2003). Special issues focused on telecenters or public access computing were published by several journals relevant to the field of ICT for development: The *Journal of Development Communication* (*JDC*, 12(2), 2001) and the *Electronic Journal of Information Systems in Developing Countries* (*EJISDC*, 4, 2001) offered early analyses of telecenters. For the most part, they focused on why telecenters were not working and how to improve them. Five years later, the *Journal of Community Informatics* (*JoCI*, 2(3), 2006) dedicated an entire issue to telecenters. In 2006, the majority of the studies were still trying to figure out how to make telecenters work better, given limited infrastructure, awareness, services, and use. Two Colombian case studies (Amariles, Paz, Russell, & Johnson, 2006; Parkinson & Ramirez, 2006) found limited evidence of telecenter use. Even though there is important research about public access computing in libraries in the United States (Bertot, McClure, Thomas, Barton, & McGilvray, 2007; Gibson, Bertot, & McClure, 2009), including a recent and ambitious study that assesses (for the first time) the social benefits of public access computing in the United States (Becker et al., 2010), there are relatively few studies of PAC in public libraries in developing countries (Gould & Gomez, 2010; Walkinshaw, 2007). Cybercafés have also been relatively understudied as a social phenomenon, with some noteworthy exceptions that have explored their potential contribution to community development (Finqueliévich & Prince, 2007; Gomez, Pather, & Dosono, 2012; Gurol & Sevindik, 2007; Haseloff, 2005; Salvador, Sherry, & Urrutia, 2005).

A recent and exhaustive literature review on ICT impact suggests the following:

There 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

5. For a more detailed comparison of PAC in Colombia versus the other countries included in the *Landscape Study*, see Gomez (2009), in particular, pages 32–34, which focus on Colombia.

public access has had no impacts, but because its impact is particularly difficult to identify and measure. (Sey & Fellows, 2009)

Measuring ICT impact is a difficult undertaking for a variety of reasons: Social impacts happen downstream and over time, and they are the result of multiple forces and activities; they are multidimensional, including individual, collective, and organizational dimensions, as well as human, social, economic, and political aspects; and finally, many studies have relied on economic models and theories of development which equate development with Westernization and economic growth at the expense of other dimensions of development, such as empowerment, self-esteem, and freedom (Gomez & Pather, 2012).

A growing number of scholars (e.g., Alampay, 2006; Puri & Sahay, 2007; Sharma, Dwivedi, & Seth, 2009; Zheng, 2009) have been exploring ways to assess "intangible" impacts of ICT for development. Contributing to this growing body of literature, our research collected both qualitative and quantitative data across a broad sector of the population of users of telecenters, libraries, and cybercafés from different regions of the country under study to better understand the perceived benefits, as experienced by the users, of PAC initiatives. We focused on understanding the users' experiences and perceptions of how PAC use has changed their lives. This study offers valuable insight into perceived benefits of PAC, in order to better understand the contribution of PAC to the strengthening of community development.

### Research Methods

This research used a mixed-methods approach for data collection and analysis in order to explore access to, and use of, PAC in Colombia. Fieldwork was conducted in the first half of 2010, in collaboration with a local team of research assistants. All data collection instruments addressed the question of perceived benefits or impacts of ICT, and of PAC

in particular. The data collection strategy was based on user surveys (n=1,135), structured operator interviews (100), semi-structured expert interviews (10), personal history conversational interviews with users (10), and focus group workshops (6) with operators and users in each region of the country and the capital city. User surveys drew a statistically representative sample of the population reflecting the demographic characteristics of five regions in the country.<sup>6</sup> They were conducted by local research assistants visiting different types of PAC venues during different days of the week and at different times of day, so as to minimize distortion due to day of week or time of day of the data collection. Survey respondents were sequentially selected among adult users (parental consent from minors using the venues was practically impossible to obtain) exiting the venues at the times of the visits to each venue by the data collection teams.

Using mixed methods allowed us to combine the breadth of a statistically representative survey with the depth and insight of semi-structured interviews, as well as the context and interaction of focus group workshops in different communities. Focus groups allowed for rich conversation and discussion among participants about the issue of perceived impact, and interviews with venue operators and experts afforded additional insight about the potential or observed benefits and how PAC has changed people's lives. Interview and focus group data were parsed using Atlas TI codes related to perceived impact in order to corroborate and deepen the emerging categories from survey data, and to explore the possibility of additional insights not captured in the survey.

Our data analysis used a grounded theory approach (Strauss & Corbin, 1997) to explore emerging concepts and categories in the users' experiences of PAC impact, particularly in the iterative, qualitative analysis of the responses to a particular open-ended question in the users survey. The question asked users to describe how use of computers in the public access venue has changed their

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6. To better reflect the diversity of Colombia's population, we adopted the regional distribution criteria used in the National Survey of Community Television (Angel, 1998), which divides the country into five regions based on cultural and demographic characteristics: Caribbean coast, Santanderes, Antioquia and coffee-growing region (Eje Cafetero), Central region, and Southwest region. In each of these regions, we studied a capital city with high population density and a town with medium population density (called pueblos or municipios, or municipalities, in Colombia). In each of the five regions, we drew the sample from a large city and a small town (population under 30,000) to reflect the diversity and variety of both urban and non-urban experiences in different cultural settings around the country.

lives. About half the responses were recorded and transcribed, while for the other half, the interviewer wrote down notes as part of the survey responses. All responses were analyzed in an iterative cluster analysis process that resulted in 12 emergent, non-exclusive themes. Finally, the 12 themes were further grouped into the five categories of findings which are presented and discussed below.

This study is focused on PAC, and as such it does not systematically address the use of mobile phones, even though they also play an important role as a technology for information and communication in the country. We also exclude venues that are not open to the general public (such as school computer labs), and we did not study private access to the Internet (access at home or in the workplace). While we understand that the perspective of non-users could add valuable insight to the question of ICT for development, given limited time and resources, this study does not consider PAC non-users.

## Context: PAC in Colombia

PAC services in Colombia are comprised of a relatively strong network of public libraries, some of which offer PAC, and a relatively strong network of both governmental and nongovernmental telecenters, complemented by thousands of cybercafés that have sprung up in the last few years. The presence of numerous cybercafés has transformed the landscape of public access to ICT, making computers and Internet access an easily available and relatively inexpensive commodity in large and small cities, and even in remote villages and towns. A 2007 study found that most Internet users in Colombia were located in large cities, and that the most frequent type of access to the Internet came by way of public access venues, especially paid venues (47.2%), followed by access at home (43.8%), at school (26.6%), at work (24.6%), or at someone else's home (16.3%). Free PAC was the least used (only 4.1%). There has been little research about cybercafés' services or the implications of their entry into the landscape of PAC services in the country.

As summarized in Table 1, today, there is a landscape of PAC services in Colombia that includes around 2,730 telecenters, a number comprised of

about 1,060 telecenters operated by NGOs, community organizations, and corporate social responsibility initiatives, and 1,670 operated by government-sponsored programs (primarily the national government's Compartel program, and other provincial or municipal-level government initiatives; Casasbuenas, 2007). In addition, there are about 520 public libraries that offer PAC (of a total of about 1,520 libraries in the country; Biblioteca Nacional, 2011). Finally, while there is no official registry or count of cybercafés in the country, our extrapolation of data from official reports suggests that there were about 15,050 cybercafés in the country at the beginning of 2010.<sup>7</sup>

How have these multiple PAC initiatives benefited Colombia's population? There are few, limited studies that mostly focus on how to improve the design and operation of community telecenters (Amariles et al., 2006; Gaitán, 2007; Parkinson & Lauzon, 2008; Paz Martínez, 2007; Soto, 2007), or that evaluate the performance of government-run telecenters (Colnodo, Universidad Autónoma de Occidente, Ministerio de Comunicaciones, & Telecentre.org, 2008; Ministerio de Comunicaciones & Universidad de los Andes, 2007). There are even fewer studies of PAC in Colombia's libraries (Soto, 2007), and a single, incomplete study of libraries, telecenters, and cybercafés conducted in 2009 as part of an international study, which describes some of the most salient initiatives but was not intended to assess their impact (Universidad de los Andes, 2009).

## Findings: Perceived Benefits of PAC

How does PAC change people's lives? Users perceive that they benefit from more access to more information, which helps them 1) build and maintain relationships, 2) enhance learning opportunities, and 3) conduct online transactions. There are also some negative impacts of PAC use related to each of these dimensions.

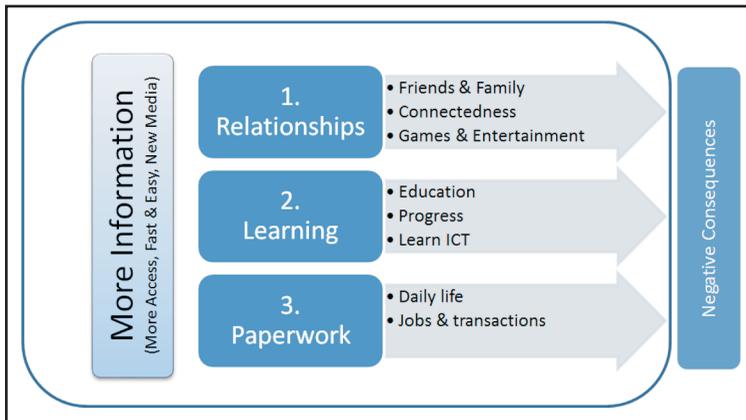
It is clear that "more information" is not an end in itself, but a means to a goal. We describe the benefit of "more information" in relation to the other benefits, given that it is the most frequent way in which respondents talk about their experience. We also describe the negative impacts

7. Based on the ICT Ministry's quarterly report first quarter of 2010 (Ministerio de Tecnologías de la Información y las Comunicaciones, 2010), which cites the number of broadband connections to the Internet for shared access, separate from home and business access, and subtracting the known totals for libraries and telecenters.

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*Table 1. Distribution of PAC Services in Colombia.*

PAC Venues in Colombia	Approx. Count	Proportion
Libraries with PAC (libraries without PAC: approx. 1,000)	520	2.8%
Telecenters, Total	2,730	15%
<ul style="list-style-type: none"> <li>• Government-sponsored: approx. 1,670</li> <li>• NGO-sponsored: approx. 1,060</li> </ul>		
Cybercafés	15,050	82.2%
Total PAC Venues	18,300	100%



*Figure 1. Schematic representation of perceived impacts of PAC.*

separately, to call attention to their importance and potential for underreporting in the study. Figure 1 offers a schematic representation of the themes that emerged in study:

**Generic: More Information**

The most salient benefit of PAC experienced by users relates to having access to more information and communication resources. These categories are non-exclusive, and there is some obvious overlap between this first one and others. For example, users report enjoying new ways to communicate *with* friends and family (#1), or finding more and easier information *for* school homework (#2). Nonetheless, respondents strongly emphasize the general availability of more, faster, and easier access to information with the new tools afforded them by PAC. Library users reported the highest proportion of answers related to the concepts grouped under more information, and telecenter users reported the

lowest. There are three components to this notion of more information resources becoming available through PAC, with sample testimonials from survey respondents:

**More Access (27%):** Users most frequently report having more options, more sources, and more current or updated information through PAC; both local information and information about places and events far away are mentioned.

My life has changed because in my city it is difficult to go to a library because there are no means for that. In Quibdó, Chocó, it is difficult to access a library so the Internet makes it more accessible to do research, to communicate and all that. (Survey, Library, Medellín)

**Fast and Easy (23%):** Use of PAC is perceived to offer faster, easier, cheaper access to information and communication resources; it helps to reduce or eliminate travel, and it makes people more productive by helping them to accomplish more things in less time. Respondents also indicate that they used to have to pay for content (newspapers and books in particular), and now they find them for free.

Now with the Internet I have recent information and it is a lot easier to get it. (Survey, Cybercafé, Santander de Quilichao)

**New Media (13%):** PAC has transformed the traditional media used to get information and provide entertainment. Users report that, previously, they

went to the library, read books and newspapers, watched TV or listened to the radio, wrote letters, and spoke over the phone, but now, they can do all of these online (online books, newspapers, radio and TV stations, e-mail or Facebook instead of letters and phone, etc.).

It used to be that you had to go to libraries to do research, or teachers were the ones that kept you informed, and also radio and TV; but now you really have everything on the screen, you can have radio, TV, newspapers, you can have all the information and also communicate directly with people in any place of the world. (Survey, Library, Medellín)

These ideas are corroborated by focus group participants and during interviews with venue operators, for example:

In Marinilla, in the website about the town, there is not enough information for me to find out about what is going on daily. But on Facebook there are several groups and networks that inform about specific topics; for example, youth can find out about concerts or meetings via Facebook. (Focus Group, Marinilla)

While some respondents spoke in generic terms (e.g., that PAC provided “more information about things”), other respondents were able to articulate concrete examples of the type of information and how it was important to them. Even though there was frequently a cost associated with PAC, the perceived gain in speed and convenience almost always offset the cost of use.

### 1. Relationships

After the generic “more information” theme, the most frequent theme that emerged as an important PAC benefit was the specific notion that it helps to build and sustain relationships and leisure activities. Cybercafé users reported the highest proportion of answers related to relationships as a perceived benefit of PAC use. There are three components to this theme:

**(a) Friends and Family (25%):** PAC was perceived to enable closer contact and communication with friends and family, and to shorten distances with those who are away, especially among cybercafé users. Interestingly, for many respondents, this was not limited to maintaining existing friends, but also

offered opportunities to meet new people and make new friends, as well.

My use of the net is very frequent. . . . I use e-mail to communicate with my work team, but also to communicate with friends, to share with friends interesting emails about many topics, and to stay in touch and well connected. (Survey, Cybercafé, Pasto)

**(b) Connectedness (8%):** PAC gives users a stronger sense of belonging, of being part of a larger world. It offers users new opportunities for advancement, teamwork, and collaboration, and an increased sense of ownership of their destiny and their future. There is an important nuance in the way some respondents described a transformation in the sense of connection and relationship afforded by ICT use that goes beyond the mere cultivation of friendship: Respondents expressed an added quality of depth and connection, and a stronger sense of belonging to a larger, broader world.

So obviously it has changed my life . . . it has made my social imagination [*imaginario social*] a bit more global, because now everybody can know what is done in any part of the world. (Survey, Library, Medellín)

I have been culturally transformed; the access to the Net allows me to know things that happen around the world, and gives me better interaction with people far away. (Survey, Cybercafé, Bogota)

This notion of connectedness is a subtle yet critical thread present in the users’ perceptions of how they benefit from PAC services, one that warrants deeper study and analysis because of its potential to indirectly contribute to intangible aspects of development.

**(c) Games & Entertainment (5%):** A small proportion of users emphasize how PAC has opened new avenues for entertainment by allowing the user to spend time with friends while mostly sharing games and music.

[My child] used to be bored at home, watching TV and listening to music, but now goes to Internet [café] to have fun and chat with friends. (Survey, Cybercafé, San Gil)

I love games and since I cannot buy an Xbox I come to the Internet [café], and they have many types [of games]. (Survey, Cybercafé, Bogota)

I have more friends who play on the Net. I do my homework fast and I have time to play games. (Survey, Cybercafé, Santander de Quilichao)

The importance of relationships is also strong among interview respondents and focus groups participants, as expressed in the following examples:

A teenager or child who learns to see that the world is not just their neighborhood but that it goes much further, and who meets with people who may be in a higher technological level than we are, they see that there is much to do and much to learn, and their vision is widened. (Operator Interview, Santander de Quilichao)

The world is not just Cali, or my block. You can find a friend in Africa, in Spain, in any place. (Focus Group, Cali)

So we enter on MSN, my contacts in Venezuela and in other countries who are my friends, also from other cities in Colombia, so I come in and say hello. I take advantage of it and stay in contact with them, it makes me happy, and I say hello. (Operator Interview, Carmen de Bolivar)

While most respondents mention using email to communicate with friends and family, many also mention using social networking sites (Facebook, MySpace, HiFive, etc.) and instant messaging. There is less frequent use of voice over IP services (VoIP, like Skype or others) and webcams, although a cybercafé operator insisted that, without webcams, a cybercafé would quickly go out of business.

Furthermore, the importance of the sense of connectedness is clearly explained by one of the expert interviews:

When we speak of development . . . at the level of social awareness . . . we see the importance of ICT. Because with more technologies and more capacity to access mean precisely more information and more knowledge for the people, and in some way this has to turn into a [stronger] awareness about who I am, about my relations with others, and about my relationship with the environment around me, my surroundings, my planet. That is a type of development that nobody can take away from you, it is a development of awareness. In other words, if I am more aware, if my community is more aware, if my city is more aware and my country is more aware, we are then talking about longer-term development. This is an awareness that allows me to take care of

myself, take care of others, and take care of the planet. (Expert Interview, Bogota)

Finally, although there are a lot more gaming and entertainment activities taking place in PAC venues, these things are mostly done by kids, who were not directly surveyed in this study (as mentioned earlier, obtaining parental consent was not feasible in most of the settings). In addition, use of ICT for entertainment is a topic that people may feel uncomfortable acknowledging formally in the context of a survey. Nonetheless, its importance is corroborated by interview responses, as well as during focus groups. For example:

On the topic of social networks . . . many had an e-mail account and were using MySpace or Facebook, that is a social element, but then there is also the entertainment value, with many games online, especially the free games, and especially in the [poor] neighborhoods; kids from [wealthier] neighborhoods also play games that are paid. (Expert Interview, Bogota)

It is possible that a study that surveys minors or that includes more direct observation of their actual activities in the PAC venues would conclude that the importance of gaming and entertainment is much higher than what is reported here, which is based on adults' perceptions of how PAC has changed their lives. The fact that the young people's perspective does appear (even if faint) is, in our view, symptomatic of a more important phenomenon taking place that is going unreported in this study.

## 2. Learning

Another large cluster of perceived benefits of PAC relates to the opportunities for learning PAC affords. Telecenter users reported the highest proportion of answers related to learning as a benefit of PAC use. There are three components to the notions of learning expressed by PAC users:

**(a) Education (19%):** PAC is perceived to improve education by helping users do homework and other school research, by offering distance and online learning opportunities, by helping teachers to prepare for class and post grades online, by bringing instructors and students closer together, and by making it easier to register for classes and get results online. Moreover, education opportunities are not limited to formal education, as many also report

a stronger sense of lifelong or continuous learning about new things, new places, and new ideas. Education opportunities also strengthen people's self-esteem and positive vision of the future.

[M]any times related to education, like virtual courses that are offered on a platform by [technical college] SENA, which is of great help; also a lot more things, not just education but I can access a lot more and that is why technology is now a fundamental part of my life. (Survey, Cybercafé, Pasto)

**(b) Progress (8%):** Users expressed a new sense of being modern, of participating in a modern society and overcoming backwardness and ignorance. Users felt that they were now participating in the information society, frequently associated with an (inevitable) notion of progress, and they expressed a sense of awe at having the power to be modern at their fingertips.

The dark ages were over when we began to be in line with the much-disputed globalization. (Survey, Cybercafé, Carmen de Bolivar)

We are now in the information society and there are more opportunities to navigate and have timely information. (Survey, Cybercafé, Pasto)

The world moves on the wheels of technology, it is important for everything. (Survey, Cybercafé, Bogota)

It is about day-to-day evolution, we have to change or we will remain in the past. (Survey, Cybercafé, Bogota)

**(c) Learn ICT (3%):** A very small number of users, especially telecenter users, mentioned the benefit of learning how to use computers and the Internet, something they did not know how to do before. This was frequently expressed with a sense of pride and accomplishment.

I did not know how to use a computer, much less how to look for information, but now with the training we received I can have access to the Internet. (Survey, Telecenter, Duitama)

I used to feel useless and I was afraid of touching a computer; now I feel secure and happy that I can use the equipment. (Survey, Library, San Gil)

PAC was perceived to be improving education opportunities for both students and teachers, mak-

ing their teaching, learning, and mutual interaction easier, and in some cases, closer and more personal. Interestingly, some informants did point out a decrease in quality of education through cheating, copying and pasting, more superficial reading, and lack of discernment to distinguish credible sources of information online. Other negative issues are discussed below.

### 3. Paperwork Online

The last cluster of positive PAC benefits deals with its ability to facilitate paperwork, transactions, and other changes in daily life. Cybercafé users tended to report slightly higher proportions of answers related to both daily life activities and jobs and transactions, which are the most important themes under this category.

**(a) Daily Life Activities (9%):** Users reported doing more things online without having to go to other places. They said that they seek more information and practice better collaboration and sharing than they would otherwise. Disabled people, in particular, reported benefits of finding information and doing things that were far more difficult without computers. Some users regretted the amount of time they now spent on computer use.

Before there were days in which you did not need to go to the Internet, but today that is impossible because my family and work life depend on it. (Survey, Cybercafé, San Gil)

Let's see, when I had my [visual] disability, I felt I had lost everything: Why? Because I worked as a graphic designer and . . . I thought it would be very difficult to continue . . . but now I know that a visual disability is not an obstacle, because with [computers] we can easily go and use any system as long as it has the [accessibility-enabled] software. (Survey, Telecenter, Pasto)

**(b) Jobs and Transactions (7%):** A small number of PAC users reported that it was easier to seek and apply for jobs, and to carry out online transactions for government services (licenses, judicial past, government information), banking (making and receiving payments), and commerce (shopping, price comparisons).

Before, I used to ask for letters with bank statements and I would have to wait for days, but now all my work transactions are faster. (Survey, Cybercafé, Barranquilla)

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I am unemployed and look for jobs using [the Internet]. It is cheaper this way. (Survey, Cybercafé, Bogota)

To look for a job I used to have to go places and leave my résumé. Now, I send it by email and they can interview me and evaluate me by email, so I save time and money; this is a very positive aspect of this technology. (Survey, Telecenter, Cali)

The salience of jobs and transactions was corroborated by both interview respondents and focus group participants:

It makes life easier because before you had to wait in long lines at the bank to make a deposit or some other transaction, and now it is very easy; if you had to register for school you had to wait in line and have others push you and step on you, but not now, you simply register online and it is easy. (Operator Interview, Barranquilla)

Despite the importance of jobs and employment in the PAC and ICT literature, the frequency of their occurrence in relation to other themes is relatively low (4%), and it would be negligible if "jobs" and "online transactions" were considered separately. We bundled them together so they would not be lost in the bigger picture of perceived benefits. The low occurrence of jobs and transactions as a benefit may be due to a lack of availability or awareness, stigma (people being less willing to talk about looking for jobs, especially in hard economic times), intensity of use (looking for jobs may not be the only activity or the one they spend the most time on), recall (interviewees prefer to talk about what they did last or what was most pleasurable), preference for face-to-face interactions, or other factors that warrant further exploration.

### Negative Consequences

A very small proportion of PAC users (4%) reported negative consequences related to increased dependency or addiction, less time available, more superficial interactions or knowledge, greater expense due to new costs for PAC, problems with viruses or hackers, and lack of privacy.

Some examples of the survey responses related to negative aspects are recounted here:

You feel subjected to use the Internet. Since everybody is connected, I also have to be connected. (Survey, Library, Bogota)

The excess of information gives me anxiety. (Survey, Cybercafé, Bogota)

We are more dependent on technology than before. (Survey, Cybercafé, Duitama)

Internet makes you addicted . . . you think you control it but you really want to spend all day there. (Survey, Telecenter, Cali)

There used to be more privacy and now it is more difficult because of all the social networks. (Survey, Cybercafé, San Gil)

Internet makes you more negligent. The intimate becomes public. (Survey, Telecenter, Bogota)

It has made us more lazy because getting information online is so much easier, but it is more "light," and the information is more superficial, and we think that is enough. (Survey, Cybercafé, Medellín)

Negative aspects resulting from PAC use were also corroborated by interviews and focus group participants:

[ICTs] have changed the way people relate to each other in the family and in society: with virtual networks, people are more self-absorbed, more glued to the screen, less youth in the parks, etc. . . . What you lose is privacy . . . the sense of what is private has been transformed. (Focus Group, San Gil)

Like games and entertainment, people might not feel comfortable talking about negative changes in their lives as a consequence of their use of PAC. Underreporting negative aspects is a common problem, and as with gaming, its mere appearance in these responses is, in our view, symptomatic of a larger, unreported trend in this field.

Despite the prevalence of pornography in PAC use, especially in cybercafés, there are only two mentions of it in the survey responses, both of which emphasize the dual nature of the Internet, with positive and negative changes taking place. For example,

With Internet there are good and bad things. Some see the bad things, such as pornography, but others see that we can find information faster and do our homework in time. . . . Others say it is too expensive . . . or that it makes people lazy . . . but you can also meet new people, and see important people and chat with them too. (Survey, Telecenter, Cali)

Nonetheless, in informal conversation after interviews and focus groups, the topic of pornography in PAC comes out strongly. By law, no pornography is allowed in public spaces, including cybercafés. While all libraries and most telecenters block or discourage viewing pornography, anecdotal evidence and informal conversations with PAC users and operators emphasize the importance of pornography in driving business to cybercafés. We encountered extremes, such as cybercafés that offer private booths with door and latch, and emphasize user privacy at the venue, or cybercafés that close down early in the evening, forfeiting additional revenue, but consciously deciding not to enable or promote pornography consumption at their centers. After the conclusion of one of the focus groups, one participant bluntly stated that the Internet is good "for porn and Facebook; that is all there is." Libraries and telecenters that block or discourage pornography may be pushing users away and encouraging use of cybercafés; at the same time, they may be enabling a "safer space" for women and children to use computers and the Internet without being inadvertently exposed to secondhand pornography and the behaviors associated with it. The relation to pornography and its use is probably one of the most salient differences in use of PAC across all three venues, and it certainly warrants further investigation.

## Discussion and Conclusions

The field of ICT for development has long argued that access to information and communication through new digital technologies can contribute to community development. Nonetheless, determining the nature and the extent of that contribution has been an elusive target. PAC has increased the reach of the information revolution to millions of new users who would have otherwise been unable to access and use computers and the Internet. Most studies of telecenters have focused on ways to improve their operations so they can have an impact, and few have included cybercafés or PAC in libraries in developing countries. The early euphoria that claimed ICT would bring about a level playing field for economic growth and prosperity for all, with educational opportunities and an electronic agora of informed citizens strengthening democracy and civic participation, appears to have been misplaced; its goals have not been realized. What are

people doing in the numerous PAC centers that have been set up in developing countries, and what benefit do they derive from their use of these centers? How does PAC contribute to economic prosperity, democratization, and social inclusion?

The findings of this study offer new insight into what users perceive to be the important changes to their lives that have been brought about by PAC. Yes, there is faster and better access to more sources of information and communication using new digital media, even though speed and breadth sometimes come at the expense of quality or depth. This new power of information is mostly helpful in cultivating new and existing relations with friends and family, opening new entertainment opportunities with a sense of connection to a larger world, even though online relations may blur the boundaries between private and public information, and be increasingly superficial (see more discussion on PAC and connectedness and social relationships in Baron & Gomez, 2012a, 2012b). In addition, PAC does open new opportunities for education, starting with learning to use computers, but then graduating to more important tasks, helping teachers and students with homework, research, online courses, and lifelong learning opportunities. These give people a stronger sense of being modern and participating in the information society, even though computers also make it easier to be lazy, to cheat, and to be content with copying and pasting the first thing that pops up on Google. Finally, PAC enables changes to daily life that help users carry out online transactions (e-government, banking, shopping), as well as find and apply for jobs, even though it can make users more dependent on or addicted to the new tools, and also raises privacy and online security concerns.

The main categories of positive benefits that emerged in this study (relationships, learning, and transactions) are all fueled by more access to information, and all have potential downsides (and their negative aspects are also likely underreported). What does this distribution say about the contribution of PAC to development? Direct contributions, such as education and jobs, are not among the most salient benefits perceived by users, while expected benefits that are often cited, such as information to improve agriculture and health, are barely mentioned at all. Furthermore, there is little variation across different sources of data (interviews, survey,

Table 2. PAC Venue Strengths and PAC Benefits.

Venue Strengths and PAC Benefits	
Libraries	Information: more access, fast and easy, new media
Telecenters	Learning: education, progress, learn ICT
Cybercafés	Relationships: friends and family, connectedness, games and entertainment
	Transactions: daily life, jobs and online transactions

focus groups), except for the level of discourse: While users tend to speak of concrete experiences (e.g., no more standing in line), operators tend to speak of processes (e.g., helping with online transactions), and expert interviews tend to speak of concepts (e.g., e-commerce and digital citizenship). Overall, while interview and focus group data help us to understand the context, survey data help us to understand the frequency and relative importance of each of the emerging themes. The consistency across different data gathering techniques highlights the relevance of the findings.

Libraries, telecenters, and cybercafés all offer PAC, and it is important to understand what is common and what is unique among them, as part of a system of PAC services in the country. While most government, NGO, and donor efforts are geared toward funding PAC in libraries and telecenters, the reach and impact of these venues are dwarfed by the proliferation of cybercafés in cities and towns around the country. The most salient differences across venue types that emerge in this study are summarized in Table 2.

While the findings suggest that PAC can and does, in fact, help people with education activities and, to a lesser extent, look for jobs, the order of magnitude of these benefits is dwarfed by what users most value in their use of PAC: access to more, faster, and cheaper information and communication resources, used mostly to maintain personal relations and provide entertainment. This is not necessarily a bad thing, of course, but the contribution of PAC to social and economic development appears to be weaker and more indirect than what governments, development agencies, and practitioners in the field of ICT for development wanted or expected.

The implication of these strengths and perceived benefits is twofold:

1. Telecenters and libraries can take advantage of a positive environment for PAC in the country and the sustained government interest in supporting PAC through both public libraries and telecenters. Telecenters can capitalize on their strengths as contributors to education and learning for their communities of users, as the strongest providers of entry-level ICT training, and as a venue of choice for users to do online transactions and look for jobs.
2. Cybercafés offer the best access of all venue types, and they have the most impact on the daily lives of their users. They are also the preferred places to cultivate personal relationships and for games and entertainment. Cybercafés are least used for education. As long as users continue to seek PAC to meet their personal needs of information, relationships, and entertainment in cybercafés, this type of PAC venue will flourish. Opportunities for partnerships among libraries, telecenters, and cybercafés abound, and they ought to be more creatively explored to take advantage of the strengths of each and bring more development-oriented activities to cybercafés.

The role of PAC in helping people find jobs, a promise frequently made by politicians and corporate public relations efforts, was found to be limited. Several respondents mentioned the benefit of online transactions (banking, government licenses or documents, shopping, etc.), but only a small number of respondents mentioned jobs as a perceived benefit of PAC, and all of those were only in relation to making it easier to find information about potential jobs and apply for them online or send a résumé by email. Actually getting a job is a different story, and when asked, none of the participants in focus

groups had found a job or knew of someone who had found a job as a result of PAC use. The relation between PAC and jobs needs to be explored in more detail to acquire a better understanding of the possible contribution of PAC to employability.

The notion of connectedness, understood as a stronger sense of belonging and participation in a larger world, is one of the subtler components of the stronger relations with friends and family reported by PAC users. Stronger relations and a stronger sense of connectedness and belonging to a larger world contribute to building social capital, and that access to more information and communication resources contributes to empowering a more informed and active citizenry. The extent to which PAC fosters a stronger sense of connectedness that builds social capital, among other intangible measures that contribute to development and wellbeing, warrants additional research.

An important issue, negative consequences of PAC, is most likely underreported in this study. Focus group and interview data would indicate a higher prevalence of negative consequences than what is reported by survey respondents, which can be a consequence of positive bias to please interviewers during survey data collection. Furthermore, negative results are frequently underreported in scientific research. A more in-depth study of negative consequences would likely give more detail to the topics that were mentioned by a small proportion of PAC users: concerns with privacy and security, viruses and hackers, dependency and addiction, as well as an overall decrease in depth and quality of relationships, learning, and effort needed to get by. The issue of pornography is also huge, and greatly underreported. Additional research on the role of pornography and its implications for PAC is needed.

Public Access Computing makes a significant difference to the residents of underserved communities who do not have a computer at home or at work. Establishing clear and direct causality between ICT interventions and social or economic development has proven to be difficult. Although there is little evidence that PAC use *directly* contributes to social or economic development of the users or their communities, this study shows ways that users do perceive PAC as benefitting their lives, benefits that can be *indirect* contributions to community development. ■

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