Better Learning Opportunities through Public Access Computing

Ivette Bayo
Doctoral Student
University of Washington
ibayo@uw.edu

Monica Barba
MLIS Graduate
University of Washington
mon.barba@gmail.com

Ricardo Gomez
Assistant Professor
Information School
rgomez@uw.edu

ABSTRACT

This paper discusses how users of Public Access Computing (PAC) in developing countries gain new opportunities for education and lifelong learning. Through a study of libraries, telecenters and cybercafés in Colombia, South America, we discuss users' perceptions of better learning opportunities in formal and informal learning, their perception of "being modern" and not being left behind in the world, as well as the new opportunities for acquisition of basic technology skills. The study is based on results of surveys, interviews and focus groups, combining qualitative and quantitative data gathered in five regions of the South American country during 2010. In addition, a content analysis of the published papers and conference proceedings with the theme of education in the ICTD field from 2000 through 2010 is used to corroborate and contrast the empirical findings in Colombia. This paper contributes rich narratives from the landscape and the literature to provide a novel understanding of the contributions of public access computing to education and learning in developing countries.

Keywords: Libraries, telecenters, cybercafés, education, public access computing, ICTD

INTRODUCTION

A better understanding of the impact of Information and Communication Technologies (ICT) such as computers and the Internet, particularly among users of Public Access Computers (PAC) still represents a challenge for information researchers. In developing countries (and also among underserved communities of developed countries) there are large sectors of the population that do not own a personal computer. Users of PAC visit libraries, telecenters or cybercafés, and the nature of their use of the computer and internet resources provided in these types of venues is only starting to be better understood (Becker et al., 2010; Gomez, 2012; Sey & Fellows, 2009).

We conducted an in-depth analysis of users' perceptions of the use of PAC in Colombia, South America. The study included a combination of surveys, interviews with owners, employees, volunteers and users of PAC venues, and focus group workshops in six communities around the country. In addition, we conducted a detailed content analysis of published literature in ICTD between 2000-2010, with a particular focus on ICT and education. By consolidating these efforts we offer a comprehensive understanding of the uses and benefits in relation to learning afforded by public access to computers and the internet in developing countries. The research

questions that guided this paper are: *How do users of PAC perceive the benefits of computers and the internet, particularly in relation to their opportunities for education and learning*? *How are these perceived benefits related to what is reported in the recent specialized literature in the field of ICTD*?

The remainder of the paper is organized as follows: First, we offer a description of the research methods for ICTD literature, and the study of PAC in Colombia. We then describe the findings in both components of the study, and conclude with a discussion and comparison of the implication these findings have for information studies about PACs in developing countries and about the field of ICTD in this context.

BACKGROUND

In the late 1990s there were only few PAC experiences in developing countries around the world, mostly limited to a small number of international donor or nonprofit organization-funded "telecenters," a few libraries offering public access to computers and the internet, and a handful of cybercafés in wealthy neighborhoods and shopping malls of many capital cities and tourist towns. After about a decade these few, early PAC experiences had multiplied and spread around the developing world, sponsored by development agencies, governments, non-profit organizations, and entrepreneurs. Privately owned cybercafés, run as for-profit businesses, have grown even faster than development-oriented PAC venues. In 2012 a study of 25 developing countries reported that over 30,500 telecenters and more than 182,000 cybercafés, in addition to about 14% of 27,783 public libraries in those countries offer PAC (Gomez, 2012). This suggests telecenters and public libraries offer a very small proportion of the public access to computers and the Internet, while cybercafés offer the majority of PAC resources in developing countries.

The global interest on **telecenters** has been experienced in Colombia as well, where two case studies (Amariles, Paz, Russell, & Johnson, 2006; Parkinson & Ramirez, 2006) found limited evidence of telecenters use. Even though there is important research about public access computing in **libraries** in the United States (Becker et al., 2010), there are relatively few studies of PAC in public libraries in developing countries in the ICTD literature (Gould & Gomez, 2010b; 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 (Finquelievich & Prince, 2007; Gurol & Sevindik, 2007; Haseloff, 2005; Salvador, Sherry, & Urrutia, 2005). A recent and exhaustive literature review on ICT impact suggests, "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 public access has had no impacts, but because its impact is particularly difficult to identify and measure" (Sey & Fellows, 2009).

Furthermore, many of these studies of ICTD find that PAC is mostly used for social interactions and entertainment, and to a lesser degree, for doing homework and developing computer skills (Kuriyan & Toyama, 2007; Pal, Nedevschi, Patra, & Brewer, 2005). The study of the intersection of learning and ICT in developing countries has grown significantly in the two decades: the number of published articles on ICTs in education has grown significantly over the last decade, based on a recent search of specialized literature on WorldCat (see Figure 1). However, these studies tend focus on the development of theoretical frameworks and concepts. For example, Stevenson (2008) articulates different interactions in education through metaphor examining technology as resource; technology as tutor; technology as tool; and technology as an environment. Several articles focus on developing the concept that ICTs could be a vehicle for education reform, increasing profits through productivity gains and revolutionizing teaching and learning methods (for example Cuban, 1986; Cuban, Kirkpatrick, & Peck, 2001; Wang & Reeves, 2003). However, drawing on a review of the literature, Drenoyianni (2006) challenged the notion that the use of ICTs has resulted in such educational reforms, criticizing this claim as ungrounded. In fact, while many claim that ICTs in context of education improves the overall educational quality, this has been unsubstantiated from an empirical viewpoint (Shields, 2011). Some argue that the failure of ICTs to generate educational reform may be linked to the disappointing levels of technology penetration and success in schools (Mishra, Koehler, & Henriksen, 2011). However, there still interest, in the education sector, in the potential of ICTs' ability to transform education, particularly in low-income countries (Shields, 2011).

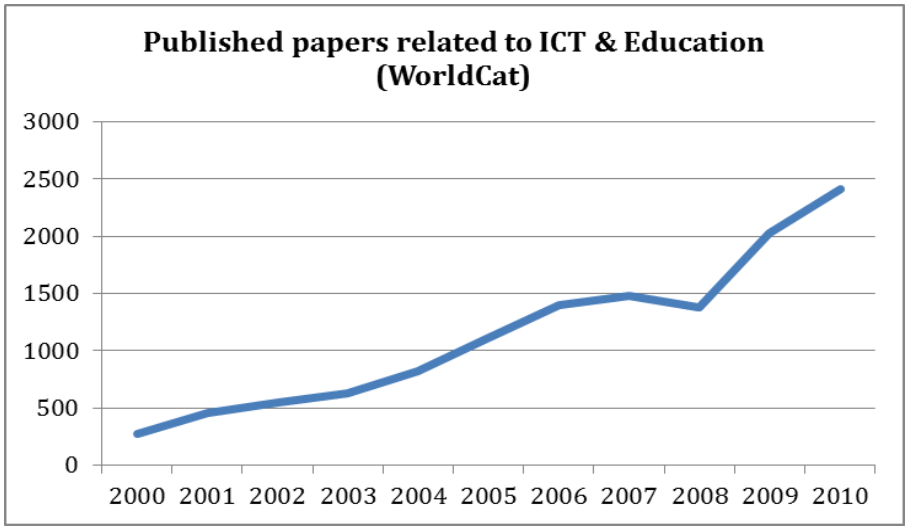

Figure 1: Published Articles on ICT and Education[1]

Interestingly, many of the intended ICT for development projects have high rates of failure; this could be attributed to the top-down mentality of a more mechanistic, control-driven approach to ICT efforts for development (Brunello, 2010). Prestridge has referred to the integration of technology into the current pedagogy "adding-on" (2007). Technology in itself is not the replacement of knowledge but rather the vehicle through which information could be acquired. Technology, can act as an amplifier of the culture roles according to Toyama (2010). ICTs in education are seen as more valuable as a symbol of modernity and progress rather than the empirical effects of substantive change they produce (Shields, 2011).

What the literature lacks is a grounded view of the uses and benefits of PAC to increase their learning and how that is similar or different from what is reported in the ICTD literature. This study aims at better understanding the users' perceptions of the education benefit of PAC and ICT, and complements this with a better understanding of the trends in the published literature about education and ICTD.

RESEARCH METHODS

ICDT Content Analysis

In 2011 we analyzed the content of about a thousand published peer-reviewed academic papers from the ICTD field: five peer-reviewed journals and two conference series between 2000 and 2010 (see details in Figure 2). The sample included almost all research papers from the top three journals according to Heeks rankings[2] (Information Technologies & International Development **ITID**, Electronic Journal of Information Systems in Developing Countries **EJISDC**, and Information Technology for Development **ITD**). Two additional journals were retained for their importance to the field, although one is too new to have a meaningful comparative rank – International Journal of Information and Communication Technologies for Human Development **IJICTHD**, and the other one – Journal of Community Informatics **JoCI**- is not ranked by Heeks). In addition to the journals, papers from the

[1] The author conducted a search in WorldCat, limited to libraries worldwide, using a keyword search 'ICT' and 'education' filtering for the years 2000 - 2010. These results were tallied by year of publication and the quantities resulted in the visual representation to demonstrate the growth journal articles with both the terms 'ICT' and 'education'.

[2] Richard Heeks, Table of ICTD Journal rankings: http://ict4dblog.wordpress.com/2010/04/14/ict4d-journal-ranking-table/

two leading ICTD conferences (once again, according to Heeks rankings[3]): the International Conference on Information and Communication Technologies and Development (**ICTD**), which came together four times during the decade (2006, 2007, 2009 and 2010); and the International Federation of Information Processing Working Group 9.4, Social Implications of Computers in Developing Countries (**IFIP** WG9.4), which also convened four times during the decade (2002, 2005, 2007 and 2009).

Acronym	Rank	Full name	Web site	Active since:	Published 2000-2010
ITID	1	Information Technologies & International Development	http://itidjournal.org/itid	2003	26 issues 194 papers
EJISDC	2	Electronic Journal of Information Systems in Developing Countries	http://www.ejisdc.org	2000	44 issues 275 papers
ITD	3	Information Technology for Development	http://itd.ist.unomaha.edu	1986	7 issues 149 papers
JOCI	NA	Journal of Community Informatics	http://ci-journal.net	2004	18 issues 115 papers
IJICTHD	13 (Too new)	International Journal of Information and Communication Technologies for Human Development	http://www.igi-global.com/bookstore/	2009	8 issues 38 papers
ICTD	Top	International Conference on Information & Communication Technologies and Development	Most recent: http://www.ictd2010.org/	2006	4 conferences (2006, 07, 09, 10) 145 papers
IFIP WG 9.4	Top	International Conference on Social Implications of Computers in Developing Countries	http://www.ifipwg94.org/	1998	4 conferences (2002, 05, 07, 09) 160 papers

Figure 2: Journals and Conferences included in Content Analysis

After all papers were identified, each paper was coded using an online coding instrument designed for this study to identify title, author(s), abstract, and keywords (if available), domain of development work, technology object of study, level of analysis, contribution to the field, epistemological stance (based on Guba, 1990), type of research methods used, and relation between technology and society (based on Iivari, 2000). The domain of development work "education" provided the subset for the content analysis included in this paper. Finally, the research questions, purpose of development, and key findings and recommendations were extracted (if explicitly stated) in the papers. Coders were asked primarily to take into consideration title, abstract, introduction, and conclusions in order to inform their choices in the codebook. A total of 41 coders participated in the coding (23 papers per coder on average), mostly consisting of graduate students from the authors' university. The majority of coders participated in a two-hour training session, and all received one-on-one coaching and mentoring.

Intercoder reliability was assessed by randomly assigning 51 papers, mixed across all sources, to two different coders. The rate of agreement for all coding decision was 88%, with the lowest ones being for epistemological stance and relation between ICT and society (68% and 66%, respectively), which are analyzed elsewhere. This result indicates that the coding scheme was trustworthy, although small differences in the results for questions with lower intercoder agreement rates may require further research and validation. Figure 8 (appended) summarizes the results of the intercoder reliability tests.

PAC in Colombia

We examined public libraries, telecenters, and cybercafés as the principal points of access to ICT in Colombia. Fieldwork was conducted in Colombia during the first half of 2010 by researchers from the University of Washington, *Universidad Icesi*, and *Fundación Colombia Multicolor*, with a team of local allies.

Several different data collection tools were used in this research: a user survey (n=1,182, distributed across five regions of the country, and including libraries, telecenters and cybercafés in both large cities and small towns); in-depth interviews with experts (n=10), semi-structured, life-history interviews with users of public access venues (n=6), structured interviews with public-access-venue operators[4] (n=100, from all regions and

[3] Richard Heeks, Table of ICTD Conference rankings: http://ict4dblog.wordpress.com/2010/04/28/ict4d-conference-papers-impact-and-publication-priority/

[4] In this research, "operator" is the person in charge of helping people and providing support to users in public libraries, telecenters, and cybercafés; they are owners, managers, employees or volunteers at these venues.

venue types), and focus group workshops (n=6) with operators and users in six different communities around the country.

Data Collection Strategy in Colombia	Number
PAC Sites visited	150
Expert interviews	10
Operator interviews	100
User Surveys	1182
Focus groups with users & operators	6
Life history interviews	6

Figure 3: Data Collection Strategy for PAC in Colombia

Triangulation between these different data collection procedures yielded strong validation of the main themes described in this paper. All research was based on the perceptions of users, operators and experts; non-users were not included in the sample, and would warrant further investigation. In addition, this research focused on PAC, and did not include use of computers or Internet in private settings (home, work or school), or use of mobile phones, both of which need to be further investigated to complement the findings presented here.

All data was collected in Spanish by native Spanish speakers. Detailed field notes were prepared after each focus group workshop, interviews were transcribed and anonymized, and all data was coded using Atlas TI, a qualitative software analysis package. Data from survey results was entered and analyzed using SPSS and Excel for statistical analysis. Responses to open-ended questions in the user survey were transcribed and grouped in an iterative process of clustering for emerging themes, based on a grounded theory approach, resulting in the themes presented in the findings.

FINDINGS AND DISCUSSION

ICT in Education

Of the 948 articles that were coded in our content analysis of ICTD literature, 23% focus on education as their domain of study. Of these, 15% dealt with both education and ICT skills, while only 5% touched on education and modernity as a theme. Much of the ICTD literature related to education regards ICT as a transformative force that is changing education systems and delivery, but our empirical findings among PAC users in Colombia show that even though ICT plays an important role in education, it may be more instrumental than the literature seems to portray: users benefit from easier ways to do homework and research, and to a lesser degree, take online courses, register for classes or check their grades online. The revolutionary nature of ICT impact on education may be understated in users' experiences.

In our empirical study in Colombia, most of the educational benefit of PAC is related to learning taking place in public access centers (PAC). This learning was found to be academic in nature and as well as supportive in nature, such as homework and lifelong learning. We identify two broad themes in PAC in education: **formal** and **informal**. These themes were supported by survey respondents and also by user interviews, PAC venue operators, and focus group participants. All included examples of availability of information with use of ICTs, ease of use, as well as accessibility of information as depicted in FIGURE 4.

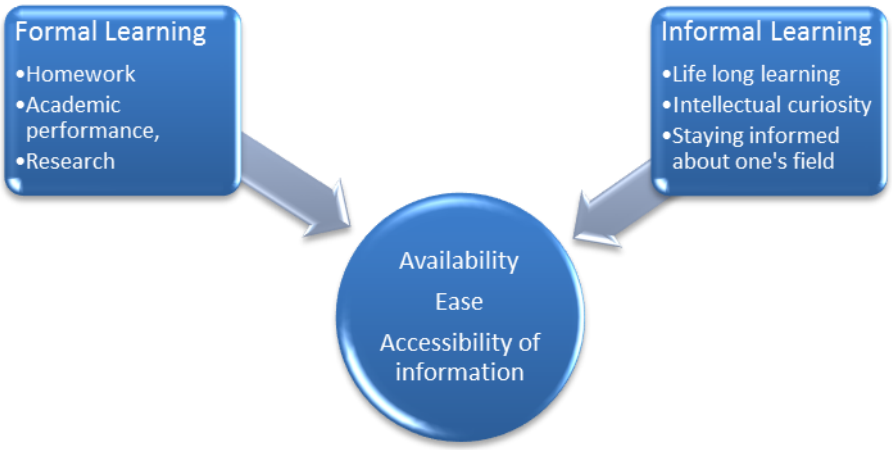

FIGURE 4: ICT for Learning as perceived by PAC users

Some user responses that emphasized the **formal education** theme are quoted below:

> *"Anteriormente me dificultaba hacer la tarea por falta de informacion y ahora entro al internet e inmediatamente encuentro lo que busco / Before homework was challenging because of missing information, now I can go to the Internet and immediately find what I need." (user survey, Medellin)*

> *"Despues me facilita mucho hacer los trabajos de estudio…/ It is easy to do homework now." (user survey, Medellin)*

> *"Ahora hay que estudiar por el internet antes no existia esa posibilidad /Now we have to study over the Internet, before this possibility did not exist." (user survey, Sogamoso)*

The **informal learning** surfaced in three main areas: perceptions of students in open-ended surveys, operators in the focus groups and also by parents in open-ended surveys. We will provide examples of each of these.

The following excerpts demonstrate the **informal learning** theme, as evidenced by homework, that were presented by students:

> *"Pues cuando yo no sabia de la sala de internet ni nada pues era un problema buscar algo. Tenia que caminar kilómetros o prestarte libros si y entonces ahora que entras a la sala de internet todo lo encuentras ahi solo tenes que escribir lo que estas buscando y todo llega ahi, asi sea larga la informacion pero todo esta ahi…. / Searching for information before required walking kilometers to borrow a book, now I only have to go to the PAC and the information is there. I can find more and do a better job." (user survey, Cali)*

> *"Eh, hago cursos virtuales, tambien leer por ahi se lo pueden publicar informaciones a otra personas que les pueden server de ese modo / I take online courses and also read publications and information that I could share with other" (user survey, Medellin)*

> *"Tengo mas amigos que juegan en red, hago mis tareas mas rapido y tengo tiempo para jugar. / I have more friends that play on the internet, I do my homework quicker and I have time to play." (user survey, Santander de Quilichao)*

The PAC operators in the Marinilla focus group discussed the users searching for assistance with homework, transcription, printing also in the **formal learning** setting. This dialogue was consistent with other PAC operators in other focus groups and thus supports the formal learning role in PAC.

Another complimentary voice to the perceived **formal learning** that was taking place was by parents of PAC users. The parents highlight the educational benefit for themselves and their children. A recurring topic that transpired especially among parents was the ease of accessing materials to facilitate learning and homework.

Also in being able to provide their children with the resources necessary to do their homework. A few examples of these are listed below:

> *"No tengo que ir (al cybercafé) mis hijos hacen las tareas en un solo lugar, antes tocaba prestar los libros donde vecinos / I don't have to go (to the cybercafé) my children do their homework in one place, before we had to borrow books from neighbors." - user survey, Santander de Quilichao*

> *"Para ayudar a mis hijos en sus tareas es mas rapido buscar en la internet. Antes la biblioteca era una demora. / To help my children with their homework it is faster to search on the internet. Searching in the library before would take time." - user survey, Santander de Quilichao*

> *"Para el aceso a las tareas de mis hijos es una forma de distraerse. / To access home work for my children it is a way to distract them." - user survey, Bogota*

Findings from the content analysis of ICTD literature reveals that ICT focus on Education, as the object of study in only 23% of the ICTD papers from 2000 through 2010. This category simply looked at the overall landscape of the ICTD field in order to gain greater understanding of the larger picture. The literature in the ICTD field is more limited in emergence of education themes compared to the broader scope of literature, as described above. However, there is still a mildly positive trend over the past decade that we found in the ICTD discourse study related to education.

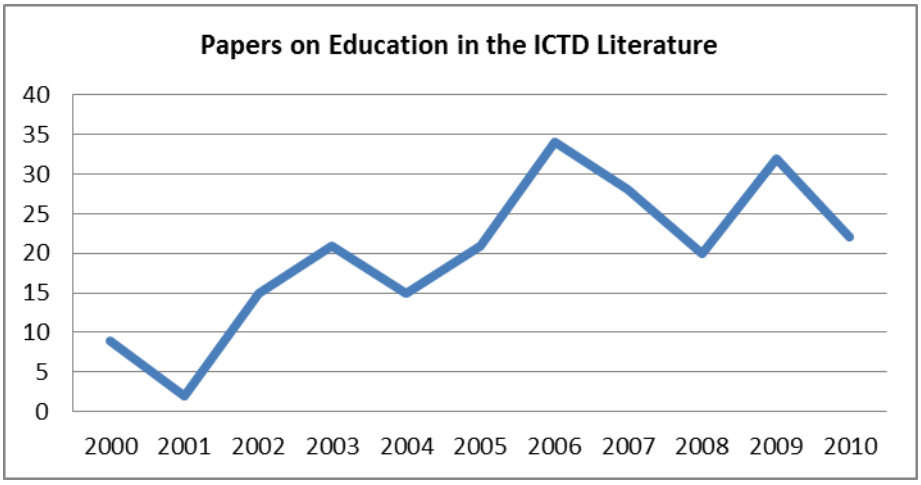

Figure 5: Number of papers focused on Education in the ICTD Literature, 2000-2010[5]

Much of this literature is emphasizing the revolutionary transformations of education with the use of ICT (Cuban, 1986; Cuban et al., 2001; Wang & Reeves, 2003) and a lot less focused on the instrumental uses of helping with homework (formal) or lifelong learning (informal) that we found in the empirical study in Colombia.

Users of PAC venues in Colombia tend to be mostly students (42%), young men and women between 15 and 35 years of age (77%). There is little difference across venues in the activities users engage in: email (42%), browse the web (20%), access social networks (mostly Facebook) (19%) and use blogs (14%). Users indicated they mostly look for information related to education (30%), personal issues (25%), entertainment (19%), news (8%) and only a small proportion (6%) to look for jobs.

When surveyed, users were asked an open-ended question about how use of PAC had changed their lives, the answers revolved around five broad categories of themes. The majority of the remarks were in a positive, optimistic, almost euphoric tone, with very few negative ones:

[5] The authors conducted the search using the ICTD Discourse data coded for "education". These results were tallied by year of publication and the quantities resulted in the visual representation of education themes emergent in the ICTD field from 2000 through 2010.

1. **More Information** is a generic category, as it refers to more information about something or for some purpose. It is comprised of answers related to more sources and more volume of information: 27%; faster, cheaper and easier access: 23%; and a transition from old to new media: 13%.
2. **Stronger Relationships** are perceived to be the most important specific (as opposed to the generic "more information") benefit of PAC. It is comprised of answers about stronger connections with friends and family: 25%; an enhanced sense of connectedness and belonging to a larger world: 8%; and new opportunities for shared entertainment through games, music, videos: 5%.
3. **Better Learning** opportunities are an important perceived benefit of PAC. This category includes notions of how PAC helps users with their education need, mostly related to homework, but also with online classes, research activities and lifelong learning: 19%; helps users participate in a sense of progress and of "being modern" thanks to ICT: 8%; and to a lesser degree, the acquisition of basic computers and ICT skills: 3%.
4. **Facilitate Jobs & Transactions** is perceived as a useful benefit of PAC. It involves changes in daily life, doing things differently than before: 9%; and access to information about jobs, easier online transactions with government services or commerce: 7%).
5. **Negative Consequences** are reported by a very small proportion of users. These include issues related with loss of privacy, superficiality of relations, dependency and addiction, virus, and hackers: 4%.

The bulk of this paper is dedicated to a detailed analysis of the third category, Better Learning, and its three subcomponents: Education, Modernity and Basic ICT Skills, and include a discussion of the negative consequences reported in relation to learning. Other dimensions of the perceived benefits are analyzed elsewhere (cite impact, relations, jobs). We intersperse the findings of the study of PAC in Colombia with the findings of the content analysis of ICTD literature around these three topics:

ICT and a sense of Modernity

The sense of modernity associated with PAC was found to not be isolated to the study we conducted in Colombia. Almost 3% of papers reviewed in the ICTD content analysis, of the subset of total education articles, were also found to refer to this concept of globalization and modernity. These studies focused with Africa, South Pacific, Costa Rica, India, and United Arab Emirates, all regions also reported dealing with similar issues of globalization and modernity. In the global economy and trade was the driving force for some of these but also in the context of competing for culture and power such as the case with our Colombia study. The idea that progress is not devoid of culture but rather that we are "partners in progress" with technology (Olutimayin, 2002) echoed in another location and time.

The perceived notion of being modern and of being part of progress as a result of using PAC was expressed by a small proportion of our PAC user survey respondents in Colombia (8%). Being able to observe the notion of progress in this context is captivating, as it reflects a greater, global force, which some users consciously expressed. This level of awareness is manifested from individuals' own reflections and personal experiences, rather than something taught. Although this 8% is a much smaller percentage than education as a perceived benefit (19%), we see it as related (part of the broader Learning theme) and as something significant and worth investigating further.

Four themes resulted from the user responses related to the sense of progress and being modern: a perception of empowerment to overcome challenges, a sense of inevitability of progress, a sense of global transformation and participation, and a sense of life-changing opportunities. Decoding the content for themes resulted from a grounded theory approach and searching for meaning of how the notion of progress manifested as a subset of learning. The resulting themes are summarized in Figure 6, and described in detail below:

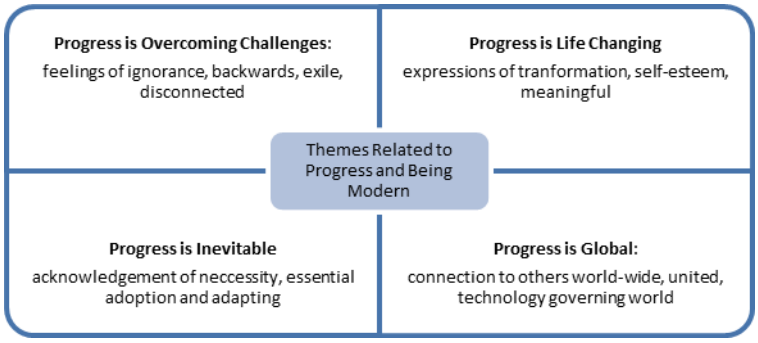

Figure 6: Themes Related to Sense of Progress and Modernity

Progress is Overcoming Challenges

Users no longer feel backwards or disconnected from society, no longer feeling ignorant, but rather feel stronger self-confidence and self-esteem. Users collectively expressed a shift in their self-perception and how others perceive them. Specifically, when users conquered the challenges of learning how to use PAC there was a greater sense of accomplishment. This was seen as an opportunity to create anew. This new life with ICT skills made users feel less ignorant and backwards. Two library users commented on such experiences:

> *"No se siente uno tan atrasado relegado por la sociedad/you no longer feel so backwards and relegated/exiled by society."(survey, library, Bogotá)*

> *"Ah sí, que mi vida antes del internet era una ignorancia completa, yo quería salirme de la ignorancia y no sabía de qué manera salirme y bueno pues gracias al internet esa ignorancia ya no es tan critica./ my life before the Internet was completely ignorant. I didn't even know how to get out, and well, thanks to the Internet, that ignorance is not as critical"(survey, library, Pasto)*

The terms ignorant and backwards may be considered strong identifiers which limit people from taking chances. Users are conscious of the stigma of being ignorant and backwards and one user attributes the advent of the Internet as helping people rid of ignorance. Users also expressed a sentiment of feeling disconnected from society by not having the skills to connect to technology. The realization that without basic knowledge people can feel further disconnected from society is fundamental for users.

> *"Ha llenado mi vida de conocimiento porque he aprendido cosas que no sabia el internet es fundamental hoy en dia alguien que no sabe internet no esta conectado con la sociedad./ It has filled my life with knowledge because I've learned things I did not know. The Internet is fundamental today, at this day and age, someone who does not know the Internet is not connected with society." (survey, library, Bogotá)*

The disconnect they feel from society when they weren't connected resulted in the development of new skills which gave greater meaning to be more productive with their time.

> *"Ha hecho la vida mas rapida antes era muy aburrido/ it has made my life faster, before I was very bored." (survey, library, Bogotá)*

Progress is life-changing/transformative

Life and opportunities can seem limitless with the introduction of new technologies that are more meaningful. There was an eager sense of willingness to modify one's life to accommodate and make room for technology. There is also an expectation that one must keep up with the changes, from this point forward:

> *"Antes no sentía ganas de abrir el correo menos de conversar, ahora es una necesidad de al menos una hora ir al internet/ Before, I didn't feel like opening my mailbox, much less have a conversation. Today, it is essential to use the Internet for at least an hour. " (survey, cybercafé, San Gil)*

As technology has advanced, there follows an expectation to adapt, in order to survive.

Progress is inevitable

The introduction and use of PAC and ICTs is an integral part of life, in order to be human, one must adapt. It essential to staying connected, and learning. As part of life, it is necessary and essential to understand and use technology. The notion of survival informs the progression of technology and the associated skills as necessary, or a "basic human need." Several older participants noted the difference in their lives, but regardless of age, people felt progressive:

> *"Yo pienso que a mí las TIC me han servido para transformar mi vida porque a la edad que yo tengo, ya tengo cincuenta y pico de años yo pensaba que me iba a complicar la vida con las nuevas TIC pero veo que es una necesidad que necesitamos cada uno de los seres humanos ¿por qué?/ ICTs have transformed my life because at my age, I am 50 some years old, I thought the new ICTs were going to complicate my life, but I see that it is necessary as the basic human needs. why? Because to be around all this information and the communication it facilitates more things for someone…" (survey, library, Pasto)*

> *Ha llenado mi vida de conocimiento porque he aprendido cosas que no sabia el internet es fundamental hoy en dia alguien que no sabe internet no esta conectado con la sociedad / It has filled my life with knowledge because I've learned things I did not know. The Internet is fundamental today, at a time when someone who doesn't know the Internet is not connected with society." (survey, library, Bogotá)*

Progress is Global

We can now learn more about the world, technology is governing the world, the thread keeping it together and globalization has resulted in us feeling connected and spreading knowledge. This is also related to connectedness and more information. The final theme that emerged was being part of a global society; the idea of greater global connection. There is also this idea of progress as a result of globalization. There is opportunity for change that is available when one is part of a global connected society. Globalization can be seen as both a necessity and can carry a negative connotation as well. It brings us closer and also changes the way we view community and interaction. Globalization poses challenges as well with contradicting views of ICTs: standardization versus localization (Walsham & Sahay, 2006). "… in both policy and practice the importance of ICT is more due to its power as a symbol of modernity and progress than any utilitarian value (Shields, 2011)." In the words of our respondents,

> *"Puedo aprender mas rapido y conocer en menos tiempo en relacion a años anteriores mas acceso a la informacion gracias a un mal necesario llamado globalizacion. / I can learn faster and I understand it in less time, in relation to previous years, there is more access to information thanks to necessary evil called globalization." (survey, library)*

> *Antes era supremamente cosotos y no habia tantos sitios que brindaran este servicio, ahora gracias a la globalizacion existe gran oferta para satisfacer necesidades de informacion en caulquier momento/ Today, thanks to globalization, a great opportunity exists to satisfy our information needs at any moment." (survey, cybercafé, Duitama)*

> *"El futuro si está en nuestras manos … si no el uso del computador para qué, no solo para tener amigos, sino para su vida laboral, productiva, entonces en ese sentido si la cosa la vemos más allá por supuesto que hay unos límites, y esos límites se podrían superar si hay un apoyo institucional" progress, the future is in our hands … Otherwise why user computers, not only to have friends but also for work life, productivity, then I feel then in that sense if we see it far away then there are limits, but those limits can be overcome if we have institutional support"*

Users can learn more about the world and redefine their role in the world; having greater opportunities to participate in world affairs with new awareness. Being modern, and progress informs how users see themselves in relation to the world; with a new medium, the Internet, users have access to the world where they are introduced

to limitless opportunities, but it begins with one critical step, the development of basic ICT skills to create those opportunities.

PAC and Basic ICT Skills

The notion that we uncovered in the empirical study of PAC users in Colombia is complemented by findings of the content analysis of ICTD literature. The development of ICT skills in the content analysis accounts for 12% of the papers we coded (27 out of 219), and in them we found a more global interpretation of learning ICT skills. There is little to no research on the benefits of learning basic ICT skills in developing countries, the focus is more on the economic outcome and finding employment opportunities. There were two main positions: ICT skills for education and ICT skills for work. The discourse ranges in locations from United Arab Emirates, Nepal, South Africa, South India, Nigeria and Thailand to name a few and is consistently at the more global level of inquiry. The general ideas that came up were on teacher training of ICT skills, utilizing ICT skills for teaching and learning, becoming IT literate, capacity building and its contribution to human resource development, roles of gender with learning ICT skills and levels of skill acquisition. Furthermore, the literature tends to place a far higher emphasis on PAC venues as places for learning basic ICT skills than we found in our study of PAC users in Colombia.

At its most basic level, the development of learning ICT skills gives users the tools to learn and engage with the world through the use of computers and ultimately the Internet. The mention of learning ICT skills in the open-ended responses was minimal, only 3%. This minimal mention of basic ICT skills training in PAC venues may be a result of the progression and users' varying ICT skill levels. Even though many users may have learned to use ICT at a PAC venue (Sciadas, Lyons, Rothschild, & Sey, 2012) For those who developed basic computer skills prior to the survey they may not feel or remember it as something central to changing their lives. Additionally, this response may have been a result of users thinking about greater outcomes other than ICT skills. These other outcomes include feeling a sense of connectedness and enabling relationships (Baron & Gomez, 2012a, 2012b); transactions and jobs; and access to more information, in general. The benefits of ICT skills using PAC may seem obvious and therefore not mentioned.

Training

Users realize that learning now to use technology takes time and practice. The users visited the PAC venues frequently, Telecenter users reported the highest proportion of answers related to learning as a benefit of PAC use by **t**aking advantage of opportunities to learn and utilizing workshops and trainings offered. Gomez et.al. (2011) found that telecenters offered more structured and comprehensive training than other types of PAC venues. The engagement of operators and the range of trainings offered to develop ICT skills may account for the greater responses of ICT skills as beneficial to the users in telecenters.

Research on the role of infomediaries, or information brokers (Gomez et al., 2011; Gould & Gomez, 2010a), found that infomediaries assist in the transfer of knowledge, purposefully engaging PAC users across all venue types to support their development of ICT skills and basic information needs. The infomediaries at PAC venues both paid and non-paid include librarians, staff, operators and volunteers provide a platform for digital literacy in their position to share information. As noted by Gomez, Fawcett Turner, libraries in particular, hosted training for senior citizens to learn ICT skills for word processing e-mail and chat. Nonetheless, respondents in our study corroborate that telecenters are the most relevant venues for ICT training.

> *"…este Telecentro es un referente en este tema y lo es tambien en acercar a la gente en technologia y acerca a la gente en tecnologia. Yo le digo la gente ests no es un instituto de capacitacion, aunque nosotros acreditemos que las personas vinieron aca y asistieron a un curso…/The telecentre is a benchmark in this area and it is also in bringing people in and near around technology. I tell people ESTs is not a training institute, although we shown that the people came here and attended a course." (Interview, Telecenter, Pasto).*

Learning

Skills and competencies – computer literacy, digital literacy (Fonseca, 2010) she also states that learning these skills are far more complex (and competencies –demanding and challenging). How people learn and take in these skills. In general, or collectively, acquiring basic computer skills includes 3 key components: **hardware** (e.g., mouse, keyboard/typing, power on/off), **software** (e.g., word processing, operating system), and **Internet skills** (e.g., web browsers, e-mail, chat, social networks). Additional skills for computer use and navigating the Internet include but are not limited to use of thumb drive or portable hard drive, printers, uploading pictures, downloading. Moreover, according to our respondents, the process of learning ICT skills is not a technical process alone, but one in which users overcome fear and uncertainty, exert extra efforts to acquire new skills, and are generally rewarded by a sense of pride in the accomplishment, as described in the following figure:

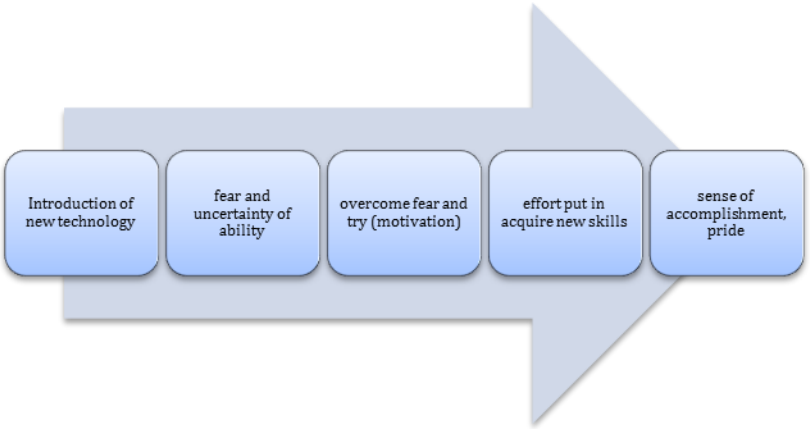

Figure 7 Schematic Representation of the Process of Learning ICT Skills in PAC Venues

The process user learning ICT skills went through as suggested by users perceptions followed a pattern: fears, learning the new skills, overcome fears, and producing a greater sense of accomplishment. From the survey responses, users expressed feelings of fear when confronting with the changes in technology. This was often followed by an incident or an acknowledgment of the users' ability to work through the fear and he/she can now benefit from learned ICT skills. Overall, the general sentiment from the users was that of fear of the unknown and uncertainty and giving into it and coming out on the other end. They were able to conquer a fear and try to learn – in the end, they learned new skills and felt a sense of accomplishment and pride.

On a more personal level, the users were proud of accomplishing something that may have been difficult as a result of fear. Fear of using ICTs, such as the computer, resulted in feeling useless. However, once users learned ICT skills, they felt proud of themselves having accomplished something unimaginable and they described the joy this brought to them.

People are afraid, yet, willing to challenging themselves. This may have to do with the sense of being modern and keeping up with technology, and society. User responses that spoke to this include:

> *"Antes me sentia inutil y me daba miedo tocar un computador, ahora me siento seguro y conteanto de poder manejar el equipo./ I used to feel useless and I was afraid of touching a computer; now I feel confident and happy that I can use the equipment" (Survey, Library, San Gil)*

> *Primero no sabia casi nada de la tecnología y empecé a ir al internet y ahora se mucho./ At First, I didn't know hardly anything about technology and then I started to use the Internet and now I know much more. (survey, cybercafé, Medellín)*

Overall, there was a more meaningful reflection from the survey responses about learning something new. Having acquired a new skill, this is similar to progress in that one is no longer considered backwards, but instead progressing with society. By acquiring new technology skills users acknowledged that they now had more opportunities. One user explained the new skills learned:

> *"Aprendí a manejar un computador a enviar correo a digitar un trabajo en word./ I learned to use a computer, to send email, to type a document in word." (survey, telecenter, Duitama).*

There was mention of advanced skills beyond simply learning computer basics. As one operator noted:

> *"la mayoría de las personas que trabajan eh, editando videos, editando audio, haciendo diseños de impreso o páginas web, acceden a internet pero más como para sacar información aunque cuando se hacen los talleres siempre la gente se mete a facebook o Hi5 o a Sónico… Most people who work editing videos, editing audio, making print designs or web pages, [they] access the Internet but mostly to get information even though people go to workshops, they are mostly on Facebook or Hi5 of Sonico." (operator, venue, Cali).*

Negative Impacts of PAC and ICT

The perceived negative impacts of ICT are minimal compared to positive ones expressed by the participants. However, 4% occurrence of the perceived negative impacts is significant enough to warrant mentioning. This is especially evident since there are factors that could contribute to silencing of negative consequences of these: Hofstede's cultural constructs and social desirability response bias (SDRB) in particular (Hofstede, 2001).

Below are a few quotes of what some participants in Colombia had to say about the negative implications of ICT.

> *"There is now minimal reading; there is a lot more laziness" (Survey, Cybercafé, Bogota).*

> *"En mi casa habia internet pero nos lo quitaron porque nos volvimos adictos al internet hasta las 4 am / in my house we had internet but they took it away because we became addicted until 4 am" - Focus Group Bogota*

> *"a pesar que es delicioso chismosear [en facebook], es una perdida total de tiempo / besides that it is wonderful to gossip [in facebook] it is a total waste of time" - Focus Group Bogota.*

Two of the participants in the focus group in Maranilla spoke about learning to search and finding new codes of communication, which could be a bad thing when young people start omitting words, changing the vocabulary, they start creating their own method of communication. But a more general perception is that ICT make it easier to be lazy, superficial, and to actually do less well in school. In fact, cybercafé operators in informal conversation repeated stories about how kids come to the venue to play games while they (the operators) do their homework, so "everybody wins:" kids get to play, cybercafé owners get revenue, and homework gets done. This is an area of problematic uses of ICT in relation to education and learning that deserves better study.

In the ICTD literature between 2000 and 2010, the negative impacts of ICT were expressed very few of the papers focused on education. Two instances where negative aspects were highlighted included the disparity of access to training due to gender and how these new forms of communication online are affecting their family commitments as well as religious and cultural norms. It is important to highlight that while these instances occur in the neighboring countries of Oman and United Arab Emirates the authors feel that it is not representative of the scope of negative effects of PAC and ICT in general.

CONCLUSIONS

This study contributes a nuanced understanding of the perceived benefits of PAC in relation to education and learning. ICT are reported to be transforming education in developing countries, but what most users experience is greater ease in doing their homework and school research, and additional opportunities for lifelong learning. The mismatch between what is emphasized in the ICTD literature, and the perceptions of users, warrants further investigation.

Users of PAC report feeling a stronger sense of belonging to a modern world and of participation in progress. This type of perception is infrequently reported in the ICTD and education literature. The empowering notion of modernity, together with its potentially naïf understanding of overcoming backwardness and participating in an inevitable progress, deserves more analysis. The narratives, while colorful, offer representations that help paint

the picture of modernity and connectedness as a benefit of PAC. Being identified as backwards or ignorant has a way of impeding progress through creating a self-fulfilling prophecy of sorts. Yet, it is a very powerful statement to see, feel and experience the power that technology has the ability to transform that feeling. Being on the ground and hearing from multiple sources of the power the users felt and that how PAC were able to change their label of naïve and unworldly. The power to change the mindset, not only of others, but also of themselves, and to now be part of the global world, connected, interconnected and united.

The benefits of PAC offering basic ICT skills training and opening the doors to information technologies is widely reported in the ICTD literature, but uncorroborated by the empirical study of PAC users in Colombia. Only few users reported the benefit of learning to use ICT, although those that did associate it with a great sense of empowerment and pride. Nonetheless, the role of PAC in offering basic skills training may be overstated in the ICTD literature.

While the negative impacts of PAC in developing countries are vastly underreported in both the specialized ICTD literature and in the empirical study of PAC in Colombia, there may be more perverse effects of ICT to uncover through additional research. In the majority of the studies in the field of ICTD there is the notion that development is good and thus positive voices are likely to emerge, while negative voices are suppressed - what is known as social desirability response bias (Hofstede, 2001). Nonetheless, PAC users spoke of the potential harms of ICT by shifting priorities, lack of privacy, waste of time, and negative changes in the way they communicate. The prevalence of porn in PAC exists, in particular cyber cafes, according to most participants in focus groups, and continues to be mostly understudied. Further investigation is needed in order to uncover greater insights of the negative implications PAC have in local communities and families.

Our goal in this study was to present an illustration of the current landscape of the ICTD field in relation to ICT and education while providing valuable insight to the perceived benefits of PAC in Colombia. We found that 3 intuitive themes that encompassed better learning were identified: Opportunities for formal and informal education, a strong sense of participating in progress and modernity, and opportunities for basic ICT skills training. We believe that the materials presented here provide empirical evidence of the importance of perceived benefits of PAC that could aide in providing valuable direction to the future contributions of researchers and policy makers alike.

APPENDIX

Coding Category	Type of field	Intercoder agreement rate
1. Title	copy & paste	100%
2. Author(s)	copy & paste	100%
3. Journal / Conference name	single choice	100%
4. Year	single choice	100%
5. Abstract	copy & paste	100%
6. Keywords or Index Terms	copy & paste	80%
7. Domain of development work	multiple choices (non-exclusive)	92%
8. Technology object of study	multiple choices (non-exclusive)	82%
9. Scope, level of analysis	multiple choices (non-exclusive)	82%
10. Main type of contribution to the field of ICTD	multiple choices (non-exclusive)	73%
11. Research Question(s)	copy & paste	92%
12. Key findings or recommendations	copy & paste	92%
13. Goal of Development	copy & paste	94%
14. Relation between ICT and Society	single choice	66%
15. Epistemological Stance	single choice	68%
16. Research Methods	single choice	82%
Total Intercoder Agreement rate		**88%**

Figure 8: Codebook and Intercoder Agreement

REFERENCES

Amariles, F., Paz, O. P., Russell, N., & Johnson, N. (2006). The Impacts of Community Telecentres in Rural Colombia. *The Journal of Community Informatics, 2*(3).

Baron, L. F., & Gomez, R. (2012a). *Perceptions of Connectedness: public access computing and social inclusion in Colombia*. Paper presented at the HICSS 2012, Maui, Hawaii.

Baron, L. F., & Gomez, R. (2012b). Social Network Analysis of Public Access Computing: relationships as a critical benefit of libraries, telecenters and cybercafés in developing countries. Paper presented at the iConference 2012, Toronto.

Becker, S., Crandall, M. D., Fisher, K. E., Kinney, B., Landry, C., & Rocha, A. (2010). Opportunity for All: How the American Public Benefits from Internet Access at U.S. Libraries. Washington DC: Institute of Museum and Library Services.

Brunello, P. (2010). ICT for education projects: A look from behind the scenes. *Inf. Technol. Dev. Information Technology for Development, 16*(3), 232-239.

Cuban, L. (1986). Teachers and machines : the classroom use of technology since 1920. New York: Teachers College Press.

Cuban, L., Kirkpatrick, H., & Peck, C. (2001). High Access and Low Use of Technologies in High School Classrooms: Explaining an Apparent Paradox. *American Educational Research Journal, 38*(4), 813-834.

Drenoyianni, H. (2006). ICT in Education: The Opportunity for Democratic Schools? *European Journal of Vocational Training, 39*(3), 5-20.

Finquelievich, S., & Prince, A. (2007). El (involuntario) rol social de los cibercafés (Cibercafes' (involuntary) social role). Buenos Aires: Editorial Dunken.

Fonseca, C. (2010). The Digital Divide and the Cognitive Divide: Reflections on the Challenge of Human Development in the Digital Age. *Information Technologies & International Development*.

Gomez, R. (Ed.). (2012). Libraries, Telecentres, Cybercafes and Public Access to ICT: International Comparisons. Hershey, PA: IGI Global.

Gomez, R., Fawcett, P., & Turner, J. (2011). Lending a Visible Hand: An analysis of "infomediary" behavior in Colombian public access computing venues. Paper presented at the IAMCR, Istanbul, Turkey.

Gould, E., & Gomez, R. (2010a). Community Engagement and Infomediaries: challenges facing libraries, telecentres and cybercafés in developing countries. Paper presented at the iConference 2010, Urbana Champaign, IL.

Gould, E., & Gomez, R. (2010b). New challenges for libraries in the information age: A comparative study of ICT in public libraries in 25 countries. *Information Development, 6*(11).

Guba, E. G. (1990). *The Paradigm dialog*. Newbury Park, Calif.: Sage Publications.

Gurol, M., & Sevindik, T. (2007). Profile of Internet Cafe users in Turkey. *Telematics and Informatics, 24*(1), 59-68.

Haseloff, A. M. (2005). Cybercafes and their Potential as Community Development Tools in India. *The Journal of Community Informatics, 1*(3), 13.

Hofstede, G. (2001). Culture's consequences : comparing values, behaviors, institutions and organizations across nations. Thousand Oaks, Calif. [u.a.]: Sage Publ.

Iivari, J. H., Rudy Klein, Heinz K. (2000). A Dynamic Framework for Classifying Information Systems Development Methodologies and Approaches. *Journal of Management Information Systems, 17*(3), 179-218.

Kuriyan, R., & Toyama, K. (2007). Review of Research on Rural PC Kiosks: Microsoft Research.

Mishra, P., Koehler, M. J., & Henriksen, D. (2011). The Seven Trans-Disciplinary Habits of Mind: Extending the TPACK Framework towards 21st Century Learning. *Educational Technology, 51*(2), 22-28.

Olutimayin, J. (2002). Communication in health care delivery in developing countries: which way out? *Pacific health dialog, 9*(2), 237-241.

Pal, J., Nedevschi, S., Patra, R., & Brewer, E. (2005). *A Multi-disciplinary Approach to Studying Village Internet Kiosk Initiatives: The case of Akshaya*. Paper presented at the Policy Options and Models for Bridging Digital Divides, University of Tampere, Finland.
http://www.globaledevelopment.org/seminar_programme.htm

Parkinson, S., & Ramirez, R. (2006). Using a sustainable livelihoods approach to assessing the impact of ICTs in development. *Journal of Community Informatics, 2*(3).

Prestridge, S. (2007). Engaging with the Transforming Possibilities of ICT: A Discussion Paper. *Australian Educational Computing, 22*(2), 3-9.

Salvador, T., Sherry, J. W., & Urrutia, A. E. (2005). Less cyber, more café: Enhancing existing small businesses across the digital divide with ICTs. *Information Technology for Development, 11*(1), 77-95.

Sciadas, G., Lyons, H., Rothschild, C., & Sey, A. (2012). Public Access to ICTs: Sculpting the profile of users. Retrieved from http://www.globalimpactstudy.org/2012/01/user-profiles-paper/

Sey, A., & Fellows, M. (2009). Literature Review on the Impact of Public Access to Information and Communication Technologies *Working Paper No. 6*. Seattle: Center for Information & Society, University of Washington.

Shields, R. (2011). Ict or i see tea? Modernity, technology and education in Nepal. *Globalisation Soc. Educ. Globalisation, Societies and Education, 9*(1), 85-97.

Stevenson, I. (2008). Tool, tutor, environment or resource: Exploring metaphors for digital technology and pedagogy using activity theory. *Comput Educ Computers and Education, 51*(2), 836-853.

Toyama, K. (2010, Nov-Dec). Can Technology End Poverty? *Boston Review*.

Walkinshaw, B. P. (2007). Why Do Riecken Libraries Matter for Rural Development? A Synthesis of Findings from Monitoring and Evaluation: Riecken Foundation, Wash. D.C.

Walsham, G., & Sahay, S. (2006). Research on information systems in developing countries: current landscape and future prospects. *Information Technology for Development, 12*(1), 7-24.

Wang, F., & Reeves, T. (2003). Why Do Teachers Need to Use Technology in Their Classrooms Issues,Problems,and Solutions. *Computers in the Schools, 20*(4), 49-65.