GENDER AND PUBLIC ACCESS COMPUTING:
AN INTERNATIONAL PERSPECTIVE

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ABSTRACT
Information and Communication Technologies (ICTs) and public access to computers with Internet connectivity in particular, can assist community development efforts and help bridge the so-called digital divide. However, use of ICT may not be the same for women as it is for men. Technical, social and cultural barriers exacerbate women’s exclusion from the benefits of ICT for development. This paper is based on a qualitative analysis of the benefits of ICT and the barriers facing women to fully realize those benefits, particularly through public access places such as libraries, telecenters and cybercafés. We describe individual benefits such as increased self-esteem, reduced isolation, access to markets, empowerment and access to health information. We also describe collective benefits such as economic growth, improved health and education, capacity building and cultural transformation. Finally, we discuss barriers that are particularly significant to women such as location, infrastructure and connectivity; time and money; lack of relevant content; low education and literacy; and social norms and perceptions. This paper draws from reports of a larger study of public access venues in 25 developing countries around the world, which are publicly available online.

1. INTRODUCTION
Information and Communication Technologies (ICTs) are playing an important role in shaping the nature of social interactions in the contemporary world (Castells, 2004; Unwin, 2009; Warschauer, 2003). ICTs can contribute to the economic and social development of communities and developing nations are adopting strategies to make ICTs, particularly computers and the Internet, more widely available to the general public through public access venues such as libraries and telecenters. At the same time, cybercafés have sprawled in many urban centers around the world, offering low cost public access to ICTs, particularly computers and the Internet, sometimes even with “involuntary” contributions to social development (Finquelievich and Prince, 2007).

In this paper we offer a qualitative analysis of personal and collective benefits of ICT for women and barriers that hinder women’s use of public access computers in developing countries. We review the recent literature on gender and ICT for development and contrast it with publicly available data from a recent study of the Landscape of public access to ICT in 25 developing countries, conducted by the University of Washington’s Information School.

Most of the specialized literature on gender and ICT does not specifically address the challenges of public access ICT and most of the findings of the Landscape Study of public access do not focus on gender issues in particular. With this in mind, the purpose of this paper is to compare and contrast empirical findings from a large-scale study in 25 countries, with findings reported in recent specialized literature on gender and ICT, in order to suggest a typology of ICT benefits and barriers to realize those benefits, particularly focused on women.

1 Acknowledgements: This paper draws in part from ongoing research by the Technology and Social Change group at the University of Washington’s Information School. An earlier version of this paper was presented at Hawaii International Conference on System Sciences (HICSS-44) © 2011 IEEE, used with permission.
using ICT in public access venues.

“Public access venues” are venues that offer public access to information and services that are available to all. In this study we focused on three types of venues that offer access to computers and the Internet: libraries (open to the general population, funded by government sources, intended to meet local community information needs as a public service), telecenters (not-for-profit centers open to the public, which offer ICT as part of their services or other activities that are intended to help community development and may or may not charge a fee) and cybercafés (for-profit centers that are open to the public, offer ICT access and services, generally charge a fee and do not necessarily have an intent to support community development). This study excludes school and other specialized libraries that are not open to the public because access is limited to students, faculty and staff. The study also excludes other communication technologies such as mobile phones, wi-fi plazas and community radio, which would deserve specialized attention in relation to gender as well. The study does not include private uses of computers (at home or at work) and it does not include non-users. Further studies of these contexts are well warranted. Other findings of the Landscape Study in 25 countries are presented elsewhere (Gomez, 2011) and not covered in this analysis.

When women use ICTs, not only do they experience significant personal benefits, but their communities benefit as well. However, use of ICTs is not gender neutral. Studies show that due to systemic gender biases in ICTs and their applications, as well as socio-cultural norms that regard computing as a predominantly male activity, women in developing countries are more likely than men to face barriers to reaping the benefits of ICTs for their personal and community development.

We suggest the following three strategies to strengthen the contribution of ICT for women in developing countries: provide ICT training for women, establish partnerships to raise awareness of ICT benefits for women and produce content relevant to women users.

Although these findings are not novel, the contribution of this paper is that the three suggested strategies are validated by empirical findings of a large-scale international study of public access to computers and ICT in developing countries. Furthermore, a typology of benefits and barriers specific to women and public access computing is suggested.

2. LITERATURE REVIEW

Human development is characterized by “the realization of human potential in its multiple facets, the achievement of economic prosperity with social equity and the strengthening of democracy with transparency and social justice” (Gomez and Martinez, 2001, p. 12). ICTs are widely believed to have the potential to contribute to the development of communities and much research is being conducted to measure the impact of ICT and public access computers in developing countries (Sey and Fellows, 2009).

The Association for Progressive Communication (APC) has a long record of analyzing ICT for development from a gender perspective. The Gender Evaluation Methodology for Internet and ICTs: A Learning Tool for Change and Empowerment, also referred to as GEM (APC WNSP, 2005), is frequently cited as an authoritative source on gender and ICTs for development. GEM offers a comprehensive review of the evolution of feminist perspectives and theories on gender and technology. A special issue of the Journal of Community Informatics and Gender, edited by Anita Gurumurthy, had not been released at the time of writing of this paper.

The concept of gender is not synonymous with “sex” – it does not simply refer to the biological traits men and women are born with. Rather, gender is used to understand how the concepts of femininity and masculinity are constructed (APC WNSP, 2005; Gillard et al., 2008). Gender analysis “asserts that power relations in class, race, ethnicity, age and
geographic location interact with gender, producing complex and hidden inequalities that affect social change” (APC WNSP, 2005). Other researchers add that culture assigns emotional and behavioral roles to men and women; they note that “as children, individuals examine the gender appropriateness of behavior, becoming gender conformists by rejecting behavior that does not match their sex or becoming gender nonconformists by rejecting traditional gender roles” (Lemons and Parzinger, 2007). Furthermore, traditional gender roles are often oppressive to women and limit their opportunities (APC WNSP, 2005).

We embrace the cultural approach to analyze the ways in which women transform their lives through the use of ICT, with a particular emphasis on ICT use through public access venues. Gender is defined as “a concept that refers to the social and cultural constructs that each society assigns to behaviors, characteristics and values attributed to men and women, reinforced by symbols, laws and regulations, institutions and perceptions” (APC WNSP, 2005). The concept of gender is not synonymous with “sex” – it does not simply refer to the biological traits men and women are born with. Rather, gender is used to understand how the concepts of femininity and masculinity are constructed (APC WNSP, 2005; Gillard et al., 2008). Gender analysis “asserts that power relations in class, race, ethnicity, age and geographic location interact with gender, producing complex and hidden inequalities that affect social change” (APC WNSP, 2005). Other researchers add that culture assigns emotional and behavioral roles to men and women; they note that “as children, individuals examine the gender appropriateness of behavior, becoming gender conformists by rejecting behavior that does not match their sex or becoming gender nonconformists by rejecting traditional gender roles” (Lemons and Parzinger, 2007). Furthermore, traditional gender roles are often oppressive to women and limit their opportunities (APC WNSP, 2005).

Early feminist studies of women and information technology focused on the under-representation of women in IT occupations and their over-representation in operator and clerical jobs. They drew attention to the disparity between men and women’s salaries in the information technology industry and the proposed solution was to increase the number and proportion of women in the industry (APC WNSP, 2005; Henwood, 1991a, 1991b). In the 1980s, feminists turned their attention to the gendered nature of technology itself and began calling for a technology based on women’s values: “Feminists from this perspective promote women’s greater humanism, pacifism, nurturance and spiritual development and seek a new vision of technology that would incorporate these values” (APC WNSP, 2005; Griffin, 1983). A Marxist perspective views technology as a neutral tool that is used for capitalist oppression, explaining that “women’s exclusion from technology as a consequence of the gender division of labor and the male domination of skilled trades that developed under capitalism” (APC WNSP, 2005; Hartmann, 1976). Constructivist approaches reject the notion that technology is neutral and instead argue that technology and gender are socially defined. Instead of advocating for women’s inclusion in work defined as technical, feminists from this perspective suggested “a total re-evaluation of work so that many of women’s traditional tasks are recognized as skilled and technical and [are] given appropriate remuneration” (APC WNSP, 2005; Ravertz, 1965).

The more recent “technology as culture” approach views technology and gender not as fixed and given, but as “cultural processes, which (like other cultural processes) are subject to negotiation, contestation and ultimately transformation” (APC WNSP, 2005; Haraway, 1997). This perspective emphasizes the need for women to not only gain access to the knowledge available through technologies, but also to participate in knowledge creation – to transform the gendered relations of technology by becoming involved in creating their own technological culture (APC WNSP, 2005; Gurumurthy, 2004).

The field of gender and ICT highlights the potential far-reaching benefits that computing can offer to women in developing countries. However, researchers agree that
merely providing access to computers and the Internet is simply not enough to ensure women’s use of the technology (Cooks and Isgro, 2005; Gillard et al., 2007; Goldfarb and Prince, 2008; Gurumurthy, 2004; Huyer, 2005; Sreberny, 2005; Sreekumar, 2007; Törenli, 2005). In general, women in developing countries face significantly more cultural, social and economic barriers to public access computer use than their male counterparts.

3. **Research Methods**

This qualitative study builds on the publicly available results of the Landscape of Public Access to ICT, an international study conducted by University of Washington researchers in 2008-2009, in association with local researchers in 25 developing countries around the world. The countries included in the research are Algeria, Argentina, Bangladesh, Brazil, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt, Georgia, Honduras, Indonesia, Kazakhstan, Kyrgyzstan, Malaysia, Moldova, Mongolia, Namibia, Nepal, Peru, The Philippines, South Africa, Sri Lanka, Turkey and Uganda. Researchers in each one of these countries produced a country report that is publicly available at the University of Washington project site (http://cis.washington.edu/landscape/library/working-documents/). These country reports, together with the literature review of the field of gender and ICT for development, are taken as the sources of information for this paper.

In this section we briefly describe the research methods used in the international study of Landscape of Public Access to ICT, as well as the way the country data was analyzed for this paper. In particular, we discuss the research framework, the country selection criteria and the data collection strategy, based on a detailed description of methods that is publicly available (2009). Finally, we discuss the procedure for data analysis used for this paper.

3.1 **Research Framework**

The study was conducted using a framework called Access, Capacity and Environment (ACE) Framework. This framework helped the researchers focus on the range of economic, political, educational, infrastructure, cultural, organizational and other factors that affect the way people use ICT in public access venues. The three pillars of the ACE Framework are: **Access**: Physical access, suitability and affordability. **Capacity**: Human capacity and training (users and staff), meeting local needs and social appropriation. **Environment**: socio-cultural factors (including gender discrimination), political will and legal and regulatory framework and popular support.

These categories provided the basic structure for the data collection and reporting across all countries. It is noteworthy that the ACE Framework does not explicitly address gender issues in the use of ICT, except as one of several “socio-cultural factors” that are part of the Environment component. Therefore, information about gender issues in the country reports of the Landscape Study are few and hard to find, scattered or embedded in different sections of the findings and the analysis they present.

3.2 **Country Selection**

The 25 countries included in the study were selected for the study based on four types of criteria: (1) Demographic criteria: size, population, per capita income and Human Development Index (HDI); (2) Freedom of expression and political unrest; (3) Needs and readiness criteria; and (4) other factors such as existence of public library systems, regional balance and availability of qualified country research teams.

The country selection criteria are important to understand the scope of findings we discuss in this paper. The study did not include the most populous countries (China and India) even though important changes in public access to ICT are taking place there, especially cybercafés in India. It did not include all the smallest or poorest countries (e.g., Haiti or The
Gambia) even though they may need the most development assistance to provide broader public access to ICT. Finally, it did not include countries where there are significant limitations to freedom of expression or political unrest (e.g., Iraq or Myanmar); conducting independent research in those countries is more difficult and the landscape of public access to ICT might be significantly different in those contexts as well.

3.3 Data Collection

Data was collected and analyzed in each country by local research teams, all using a similar approach. Data was mostly qualitative and consisted of user surveys, expert interviews, operator interviews and site visits. A total of approximately 25,000 users were surveyed and 750 interviews were conducted using a similar instrument across all 25 countries. Each local team then analyzed their data and prepared a country report that includes issues of access, capacity and environment for libraries, telecenters and cybercafés. Data was collected in local languages in each country and the final country reports were all produced in English.

Literature review and country reports prepared by local research teams were used as sources for the analysis of this paper. All original country reports are publicly available online\(^2\) and they are referred to by country name to simplify the reading.

3.4 Data Analysis

All country reports were manually coded by assigning interpretive codes to 75 variables related to the ACE Framework and coded on Atlas TI using a subset of 25 of those same variables. Since no gender-specific variables are included in the ACE framework, we did an additional, manual annotation of issues related to gender in all country reports. We also conducted a literature review about public access ICT and gender and extended it to gender, ICT and development in general, given the scarcity of literature on public access and gender in particular. We then did an iterative process of clustering the key elements that emerged in the data and the literature review and we went back to the detailed country reports to revalidate and document each topic with examples from different countries. This iterative process allowed us to combine multiple visions and readings of the rich data collected in the study, with the key elements raised by the specialized literature on the topic, resulting in higher-level notions that are grounded in the data from 25 countries and the specialized literature in the field.

The literature review did not precede the study but was done simultaneously with the analysis of a gender dimension of public access to ICT. The details discussed here are informed both by the findings of the Landscape Study and by a review of the literature of gender and ICT. The findings may not be an exact reflection of any single country, but they represent a meaningful source of trends and patterns about gender and public access ICT for development.

4. DISCUSSION OF FINDINGS

The review of recent literature on gender and ICT and the results of the Landscape Study suggest that there are both personal and collective benefits to women through the use of ICT, as well as barriers that prevent marginalized groups in society and women in particular, from realizing these benefits. The following chart presents a typology that summarizes the key topics discussed in this section:

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\(^2\) http://cis.washington.edu/landscape/library/working-documents
Benefits of ICT for women | Barriers to fully realize benefits
---|---
**Individual Benefits** | **Collective Benefits**
- Empowerment | - Economic growth
- Increased self-esteem | - Improved health
- Reduced isolation | - Improved education
- Access to markets | - Capacity building
- Access to health information | - Cultural transformation

(barriers affect all, but especially women)

| Location, infrastructure and connectivity | Time and money
| Lack of relevant content | Low education and literacy
| Social norms and perceptions |

Table 1: Benefits and Barriers of Public Access ICT for Women

4.1 Individual Benefits of ICTs for Women

Much of the literature on gender and ICTs in the developing world cites multiple benefits that could result from women using the technologies. Here we will focus on the benefits that affect them individually, followed by a discussion of collective benefits. In each case we discuss them in relation to existing literature on gender and ICT, as well as their manifestations in the Landscape Study. While these benefits may also apply to men, in this paper we are focused on the ways they benefit women in particular. Given the relative scarcity of specific information on gender and public access ICT, it is not possible to offer a regional comparison or analysis of the findings.

4.1.1 Empowerment

Access to the Internet and public computers can also lead to women’s empowerment through providing access to knowledge. One of the most commonly cited types of empowering knowledge is civic awareness, which can lead to a better understanding of women’s rights, voting and increased civic participation. Gurumurthy (2004) writes: “E-governance programs have been initiated by some governments using ICTs to make government services more accessible to citizens by providing them electronically, in some cases with an explicit strategy to ensure these services reach women and others who face barriers to access”. Huyer (2005) suggests that the knowledge of women’s rights gained through the Internet and other ICTs can lead to “increased freedom of movement, freedom from physical violence and political knowledge and awareness”. The country report from Uganda supports this belief, indicating that women could use the information they access through the Internet to seek help from domestic violence situations. Furthermore, according to the Nepal country report, “the majority of women are still unaware of their basic rights,” which, the report claims, could be remedied by the use of ICTs.

4.1.2 Increased Self-Esteem

One of the most commonly cited personal benefits of public access computing for women in the developing world is increased self-esteem, which is considered a necessary component to empowerment. The literature suggests that wherever women have used computers and access to the Internet for their own purposes, they often report increased self-esteem (Alumanah, 2005; Huyer, 2005; Long, 2005; Sengupta et al., 2007), which is thought to come from the confidence gained “from mastering new skills and an unfamiliar technology” (Conway, 2003b). In the country report from Bangladesh, women who used ICT services “professed a higher self-assessment and realization of their potential and worth in society”. The confidence and technological capabilities women can develop from using public access
computers can help them to further their empowerment goals, as suggested by Gurumurthy and others (Gurumurthy, 2004; Huyer, 2005).

4.1.3 Reduced Isolation
Another personal benefit from using the technology is reduced isolation. Country reports from Egypt and Turkey, as well as other studies on gender and technology have emphasized how women are often confined to the private sphere in many societies, whereas men can freely participate in the public sphere (Long, 2005; Moreno Minguez, 2005; Obayelu and Ogunlade, 2006). Confinement to the private sphere can be isolating and limit opportunities for personal growth and development: recent studies show that “greater integration in employment, community and political life – that is, in the public sphere – widens horizons of awareness, opportunity and experience in various ways; while greater enclosure within the private world of family, household and kinship relations limits personal and social horizons” (Moreno Minguez, 2005). The Bangladesh country report indicates that the Internet is seen as a way to connect rural women “with their friends and families in [the] rest of the country and sometimes even in other parts of the world”. Connection to support networks is thought to reduce feelings of isolation and increase networking. This is an effect commonly reported in the literature (Best and Maier, 2007; Gurumurthy, 2004; Sengupta et al., 2007; Somolu, 2007). For example, Goulding and Spacey (2003) suggest that the Internet “creates opportunities for dialogue, exposing women to the issues and perspectives of other women living and working thousands of miles away”.

4.1.4 Access to Markets
The Turkey country report notes that women could use public access venues to “[learn about] economic issues in the country, [find] jobs and [improve] their overall status in the society,” and several country reports (i.e., Peru, Costa Rica and Brazil) indicate that ICT can help women entrepreneurs access new markets. Specialized literature suggests that increased dialogue and networking can not only help reduce isolation but also help increase access to global and local markets, thereby increasing women’s potential to earn income. (Gurumurthy, 2004; Obayelu and Ogunlade, 2006). Huyer (2005) writes that the Internet can “provide women with skills, training and market information for their small-scale enterprise[s]”. Similarly, Skalli (2006) writes that Internet access for women “encourages women to think about new ways to establish professional relations, forge alliances and broaden the scope of their interventions”. Mbarika et al. (2007) take it one step further, noting that neglecting to provide Internet access to women “deprives them and their families of income”.

Cybercafés are also offering women new opportunities for entrepreneurship. The Brazil, South Africa and the Dominican Republic country reports, in particular, suggest that setting up cybercafés has helped women in poor neighborhoods have their own business and improve their living conditions.

4.1.5 Access to Health Information
In addition, women can greatly benefit from nutrition, reproductive health and general health information available on the Internet (Gurumurthy, 2004). Many studies on gender and ICTs in developing countries identify obtaining health information on vaccinations for children and preventative measures for epidemics as one of women’s primary information needs, especially in rural areas (Comfort et al., 2003; Conway, 2003a). This notion is supported by the Uganda country report, which states that many Ugandan women currently need access to information about preventing HIV and AIDS and access to the Internet could assist in meeting this need. Also, according to Huyer (2005), access to reproductive health information on the Internet could improve women’s income-earning ability by improving
their health and decreasing their number of children.

4.2 Collective Benefits of ICTs for Women

In addition to the many personal benefits for women using public access computers, several studies cite a range of benefits for society as a whole. Here we turn our attention to the collective benefits – those shared by a community as a result of women’s use of public access computers.

4.2.1 Economic Growth

Considering that women make up approximately half of the population of most communities, improving their access to information and knowledge available on the Internet can ultimately result in greater strides toward the communities’ social and economic development, as suggested by the Uganda country report. Some researchers assert that “gender inequality tends to slow economic growth” (Mbarika et al., 2007). These authors quote a report from the International Telecommunications Union (2003), which suggests that “neglecting to give women access to [ICTs] not only deprives them and their families of income, but reduces the skill-level of a nation’s human resource, limits national productivity and bars a country from being competitive in the global market” (Mbarika et al., 2007).

Furthermore, Huyer (2005) notes that “women engage in 60-90% of the agricultural production activities in the developing world; they tend to be responsible for the gathering and use of energy for cooking, as well as for water and sanitation needs in their communities”. Thus, Huyer notes, the value of information to women is tremendous and affects not just their lives but also the lives of others in the community. Mbarika et al. (2007) write: “women can play an instrumental role in lifting their families out of poverty by participating in the labor force. Women are more likely to invest their earnings in their children and to assume critical, life-sustaining responsibilities”. Elnaggar (2008) states that ICT can enable women to “participate effectively in numerous development fields, including planning and decision making at the family, institutional and societal levels”.

4.2.2 Improved Health and Education

In addition to the potential for economic development, several studies have noted other social benefits for communities in which women and men have equal access to computers. Chief among these are improved health and education services within the community. Gurumurthy (2004) writes that ICT devices “can enable health education and information dissemination, bring communities and health facilities closer to each other through regular systemic information exchange and offer simple solutions for collecting and analyzing information about disease and health-seeking behaviour to help health interventions become more locally relevant”. It is important for women in developing countries to have access to such information, not only because they are often the providers of family health care (Huyer, 2005), but also because studies have shown that when women have access to information, they are more likely than their male counterparts to share their knowledge with others creating a ‘multiplier effect’ (Sengupta et al., 2007). Abrahamson and Fisher (2007) have proposed a model for this type of information sharing, which they termed “lay information intermediary behavior” or LIMB. Lay information mediaries (LIMs) are those who “seek information on behalf or because of others” (Abrahamson and Fisher, 2007). Women often play the important role of lay information mediaries in their families and communities, particularly with regard to health and education issues, as reported in the Costa Rica, Uganda and Dominican Republic country reports. It follows that increasing women’s access to information available on the Internet could benefit the community as a whole.
4.2.3 Capacity Building
Additionally, studies indicate that when women in developing countries are given equal access to relevant ICTs and adequate training in using the technologies, they develop the capacity to produce their own information using ICTs rather than simply consuming and sharing the knowledge with others. For example, Somolu (2007) studied African women’s access to and use of blogs. Her study found that African women were, among other things, blogging about: art, career/education, current affairs/politics, religion/spirituality, fashion, food/health, parenting/pregnancy, relationships, sports, technology and women’s empowerment issues. According to the study, “when women blog – irrespective of the topic – they are sharing their life experiences and perspectives, documenting and passing on knowledge, reaching out to other women (and men) and giving women a voice” (Somolu, 2007). The issue of capacity building as a benefit of ICT is salient in the literature on gender and ICT; nonetheless, there is no evidence of this benefit in the results of the Landscape Study of public access to ICT in 25 countries.

4.2.4 Cultural Transformation
Lastly, but perhaps most importantly, women’s use of public access computers in developing countries can contribute to cultural transformation and changing stereotypes about gender and technology. Conway (2003b) reports that women users of telecenters in Mozambique who have received computer training “no longer feel that computers are for men”. As many women are confined to private spaces in developing countries, their mere presence in public access venues could have the potential to change cultural norms so that it would be more acceptable for women to participate in the public sphere. Furthermore, women’s rights organizations around the world are collating and disseminating material on women’s legal rights, sexual and reproductive rights and human rights on the Web (Gurumurthy, 2004). As more people in developing countries become exposed to this information, there is a growing potential for social transformation and a realization of gender equality. Islam and Hasan (2009) suggest that the education and awareness within rural populations that result from women’s increased use of telecenters in Bangladesh could reduce “social harassment, particularly of women, like superstition, dowry (property given at marriage), child marriage, polygamy, throwing acid on women, women torture, etc”. Additionally, the Nepal country report highlights the country’s sex trafficking problem: “Girls’ trafficking is a serious issue in Nepal, especially in the rural areas as most of the girls are lured by the prospect of a nice job in a foreign land. If issues like this can be broadcasted to people there, lots of Nepalese girls can be saved from being sold out in brothels”. The suggestion is that bringing awareness to sex trafficking issues via the Internet would be one step toward combating the issue.

4.3 Barriers to Realizing the Potential of ICT, Especially for Women
Although there is great potential for women’s use of public access computers to benefit women personally and society as a whole, there are numerous barriers that prohibit many women in developing countries from using these technologies. Some of the barriers affect both men and women equally, whereas others appear to be more restrictive to women. Some may be more important individual barriers and others collective barriers, but individual and collective barriers are grouped together for brevity.

4.3.1 Location, Infrastructure and Connectivity
Perhaps the most common barrier shared by men and women in developing countries is poor infrastructure, particularly in rural areas. Irregular power supplies and underdeveloped communication systems present significant obstacles for achieving Internet connectivity in some communities (Alumanah, 2005; Bonder, 2002; Comfort et al., 2003; Elnaggar, 2008;
Islam and Hasan, 2009; Olatokun, 2008; Somolu, 2007). Additionally, the materials, installation, human resources and training necessary to improve the infrastructure and provide Internet access are costly and overwhelming (Alumanah, 2005; Best and Maier, 2007; Elnaggar, 2008; Gurumurthy, 2004).

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Some of the barriers identified in the literature as more significant for women are related to the public access computer venues themselves. Several reports, but most vocally Bangladesh and Algeria, indicate that public access venues that are operated by women are more welcoming and more frequently visited by women: in Bangladesh, “as female infomediaries can attract female users, in the context of women empowerment such introduction may be replicated in other locations”. The lack of women support staff and trainers in telecenters and cybercafés acts as a deterrent for many women (APC WNSP, 2005; Sengupta et al., 2007; Sreekumar, 2007).

Due to social norms, some women may not feel comfortable using the venues in the presence of men. Huyer (2005) notes that “where women are present in public access centers..., gendered patterns of behavior and interaction such as harassment, belittlement of women’s abilities and the prevalence of pornography at cyber-cafes will mitigate against use by women”. In this way, public access venues are seen as “gendered spaces,” meaning that they are perceived as masculine places, unsuitable for women, as described in the Bangladesh, Algeria and Turkey country reports and corroborated by other studies (Kuriyan and Kitner, 2009; Long, 2005).

The physical location of public access venues is another commonly cited barrier for women. According to Huyer (2005), women make up the majority of the population in rural areas of developing nations and because infrastructure is often weak or nonexistent in these areas, many public access venues are located in urban areas.

In some cases, social, cultural and religious customs such as restrictions on travel for women and girls make it more difficult for women to reach these venues. This is true in some rural areas of Egypt where, according to the Landscape report from that country, “stricter rules apply [to] girls and they are less likely to go out and have many outdoor activities”. In some Muslim and Hindu cultures, it is not socially acceptable for women to venture out in public without a male chaperone and traveling sometimes poses safety concerns for women. All of these factors pose access barriers to women (Best and Maier, 2007; Elnaggar, 2008; Gomez and Camacho, 2009; Gurumurthy, 2004; Hambly Odame, 2005; Huyer, 2005; Kuriyan and Kitner, 2009; Olatokun, 2008; Sreberny, 2005).

4.3.2 Time and Money

Time is another commonly cited barrier for women. Best and Maier (2007) write that women’s environment in developing countries “is almost always primarily domestic, situated within a patriarchal highly traditional society, where women are deemed to be much inferior to men and must simultaneously juggle three roles, that of primary care giver for children and elderly relatives, that of housekeeper (cooking, cleaning, gathering firewood, looking after livestock) and, frequently, that of income-earner for the family, working in the fields, as a domestic servant or selling wares and produce”. 

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http://www.ejisdc.org
With so many demands on their time, there is little time left for women to travel to and use public access centers, as described in the country reports from Turkey and Uganda and corroborated by other researchers in the field (APC WNSP, 2005; El Naggar, 2008; Goulding and Spacey, 2003; Gurumurthy, 2004; Hambly Odame, 2005; Huyer, 2005; Kuriyan and Kitner, 2009; Obayelu and Ogunlade, 2006; Olatokun, 2008; Sengupta et al., 2007; Somolu, 2007). In Costa Rica, according to that country’s report in the Landscape Study, “the absence of day care centers with social visions prevent mothers [from attending ICT] capacity building programs”. Furthermore, some public access centers have operating times that are inconvenient for women, as reported particularly by Brazil, Sri Lanka and Algeria country reports. Because of their long workdays, if women have free time, it is generally in the evening or at night and some facilities are not open during the evening hours. Even if the facilities are open during later hours, it may be culturally unacceptable or unsafe for women to travel to the center after sundown (Sengupta et al., 2007).

The cost of using the facilities is another concern for many women, especially considering that more women than men are living in poverty (APC WNSP, 2005; Gillard et al., 2008; Goulding and Spacey, 2003; Gurumurthy, 2004; Hambly Odame, 2005; Obayelu and Ogunlade, 2006; Schreiner, 1999; Sengupta et al., 2007; Skalli, 2006; Somolu, 2007; Wheeler, 2007). Gillard et al. (2008) state that “within poor households, women are the poorest of the poor”. Gurumurthy (2004) suggests that women, in general, have less economic power than men and that, particularly in developing countries, “men hold the majority of high-skilled, high value-added jobs, whereas women are concentrated in the low-skilled, lower value-added jobs”.

For poor women, according to several country reports in the Landscape Study, the cost of access, especially in cybercafés, was identified as a critical barrier in Bangladesh, Brazil, Costa Rica, Kyrgyzstan, Malaysia, Peru and South Africa.

According to Obayelu and Ogunlade (2006), Nigerian women experience poverty in myriad ways, including “economically through deprivation; politically through marginalization in terms of their … denial of the rights to land ownership (inheritance) and access to credit facilities and other inputs; socially through discrimination in terms of their participation in decision-making at home and in the community; culturally through ruthlessness; and ecologically through vulnerability”.

4.3.3 Lack of Relevant Content
Several studies point to the lack of relevant content for women in developing nations as a primary barrier to their use of public access computers, including the Brazil and Sri Lanka country reports. In order for women to use the technologies available at public access centers, “the technologies must have a direct link to [their] basic needs and daily activities” (Conway, 2003a) and it is widely believed that the viewpoints, concerns, interests and needs of women from the developing world are not adequately represented on the Web or in computer hardware or software applications (APC WNSP, 2005; Best and Maier, 2007; Gurumurthy, 2004; Huyer, 2005; Olatokun, 2008; Skalli, 2006; Sreberny, 2005). The fact that these applications are most often designed by white Western men is seen as the root cause of this issue (Olatokun, 2008), which points to the underlying need “for women to systematize and develop their own knowledge and perspectives in order for them to be genuinely present in these spaces” (APC WNSP, 2005).

Additionally, the English language dominates the Internet and computer applications, which further limits access (APC WNSP, 2005; Comfort et al., 2003; El Naggar, 2008; Gurumurthy, 2004; Huyer, 2005; Islam and Hasan, 2009; Olatokun, 2008; Skalli, 2006; Sreberny, 2005). This is also reflected in the Peru and Algeria Landscape Study reports, which indicate that the language barrier is a common problem for users of public access.
venues. The Algeria country report states: “local content at all levels is limited mainly due to language barriers”.

4.3.4 Low Education and Literacy Levels
Low education and literacy levels were identified as barriers for women’s access in the Peru, Turkey and Uganda Landscape Study reports. According to the Turkey country report, “the literacy rate is around 87% where the rate is higher for men (95%) than women (79%)”. Previous studies have also shown that, in the developing world, women receive less education than men and suffer from lower literacy levels, which greatly inhibits their use of computers (Best and Maier, 2007; Bonder, 2002; Comfort et al., 2003; Gurumurthy, 2006; Hambly Odame, 2005; Olatokun, 2008; Schreiner, 1999; Somolu, 2007; Sreberny, 2005; Sreekumar, 2007). This is the case in Uganda, where, according to the Landscape Study report, “63 percent of the persons who had never been to school were females”. In fact, “women make up nearly two-thirds of the world’s illiterate and one out of every two women in developing countries is illiterate” (Vodanovich et al., 2010). Furthermore, girls and women in developing communities often receive poor ICT training, or sometimes none at all (Elnaggar, 2008). Sengupta et al. (2007) note that technology is seen as “requiring skills that women do not have or are not given a chance to develop”.

4.3.5 Social Norms and Perceptions
The perceptions about gender and technology in many developing nations are identified as an additional barrier to women’s access to technology. Studies report that due to socio-cultural norms, gender discrimination and lack of training, many women lack the confidence they need to learn new technologies and they frequently have lower expectations of themselves (Applegate, 2008). Bailey and Ngwenyama (2009) found that women sometimes become exposed to ICTs through their children and that women more readily take the classes at telecenters than men. On the other hand, Moreno Minguez (2005) suggests that “men are more likely than women to think they have the skills to use scientific/technological tools and equipment. This likely reflects qualifications, training and work experience. It also signals the well-known finding that women lack confidence in their capacities for science and technology, which not only leads them to avoid such fields but also not to recognize the scientific/technological skills they actually possess”.

Computing is commonly perceived as a male activity (French, 2005; Gurumurthy, 2004; Hambly Odame, 2005; Huyer, 2005; Sengupta et al., 2007; Skalli, 2006; Somolu, 2007). In conservative areas of Algeria, according to the Landscape Study report, it is considered shameful for a woman to go to a cybercafé and “many families forbid their daughters to go to cybercafés because they think that this will reduce their chance to be married”. Many analysts believe women often lack awareness of the benefits of using technology (Elnaggar, 2008; Islam and Hasan, 2009; Schreiner, 1999) and “unless women see practical and immediate benefits, it seems likely that they will continue as passive observers” (Schreiner, 1999).

4.3.6 Transgender Communities and Public Access
In our research of gender and public access computers, we found no literature on transgender individuals’ access to and use of computers in developing countries; all of the literature we reviewed is focused on comparing women’s access to men’s. And yet, the Nepal Landscape Study report identifies the transgender community as a relatively significant minority population in the country. The report states that although women hold a lower social status than men, transgender individuals are even more marginalized and are referred to as “untouchables”. The author reports that there is no mechanism in place to monitor the
transgender community’s use of libraries, telecenters, or cybercafés in Nepal, but it is believed that these individuals are virtually excluded from all public access venues. While the report does not cover the information needs of the transgender community in-depth, it does note that the community could benefit from accessing information available on the Internet about their civil rights and hormone treatments. We suggest that, like women, they may also benefit from online networking opportunities that reduce isolation, connect them with others in the transgender community, increase their access to global and local markets to improve their earning potential, increase their access to health information and provide a means to share their stories safely and anonymously. Clearly, more research is necessary to identify the information needs of these individuals and their barriers to using public access computers. We also suggest that further research be done to measure the prevalence of transgender communities in other developing nations and appropriate policies should be formulated and enacted to ensure that the transgender community has equal access to information and technology.

5. **CONCLUSIONS AND FUTURE DIRECTIONS**

Given the complex barriers to women’s use of public access computers in developing countries, it is clear that a multi-faceted approach for gender equity is vital. Based on our literature review and data provided in the Landscape Study and convergent with Huyer (2005), we suggest that ICT for development policies include the following three components.

5.1 **Provide ICT Access and Training for Girls and Women**

The findings of the Landscape Study in 25 countries, as well as other studies in the field, make it abundantly clear that ICT education should be required in primary and secondary school curriculum, with an emphasis on gender equality. If girls are taught and encouraged to use computers at a young age, they will gain confidence in using the technology. Boys and girls alike will be less likely to view computing as a male activity and traditional gender stereotypes associated with technology will be transformed.

Providing ICT training for girls and women must also be a priority for public access venues, especially in non-urban areas. Telecenters, cybercafés, libraries and other venues that have fewer women users must make a concerted effort to recruit and train women staff, who can in turn recruit and train women users. These venues can also offer “women only” hours, thereby providing a safe space for women to use public access computers without having to experience harassment from male users.

5.2 **Establish Partnerships to Raise Awareness of ICT Benefits for Women**

In order for governments to prioritize offering ICT education in schools, government officials will need to understand the potential benefits of the technology and how it can contribute to development. Likewise, in order for women to carve time out of their busy schedules to attend computer trainings at public access venues, they must see how computing can benefit themselves and their families.

Thus, women’s development and educational centers should provide role models for girls and publicize the benefits of ICT use for girls and women. Also, these centers should work with public access venues to establish partnerships with government, businesses and international organizations to implement ICT policies and programs that contribute to gender equality. Such alliances will help to spread the word on the importance of ICT use by women and provide opportunities to strategize ways to improve infrastructure and reduce connectivity costs and service fees.
5.3 Produce Content Relevant to Women Users

As awareness is raised on the importance of ICT use by women in developing countries, the IT industry must focus its efforts on developing tools to break down language barriers to information access. The majority of women in developing countries do not understand the languages that dominate the Web. IT professionals can develop multilingual tools, interfaces for non-Latin alphabets and graphic interfaces for illiterate women. Producing content in local languages is essential if ICTs are to meet the needs of women in the developing world.

Once trained in computing, female users, like the African women bloggers in Obayelu and Ogunlade’s study (2006), can produce their own content that is meaningful and relevant to other women in their communities. Furthermore, through training, women can become empowered with the tools and skills they need to enter the IT field, where they can develop software and hardware applications more suitable to women users in their communities.

In sum, a gender perspective is helpful to analyze the personal and collective benefits of women’s use of public access computers in developing countries, as well as the barriers that prevent women’s use of the technology. We noted how many of these benefits and barriers are both manifested in the Public Access Landscape Study and well documented in specialized literature on gender and ICT.

This paper contributes a useful typology of benefits of ICT and of barriers for women to take advantage of those benefits, drawing both from existing literature and from a large-scale international study in 25 countries, especially focused on public access to ICT. While there are some benefits that are discussed in the literature which do not come up in the Landscape Study (i.e., capacity building), there is very little literature on the topic of gender and public access ICT. Of particular importance is the previously unexplored area uncovered by the Landscape Study of transsexual and transgendered communities and public access to ICT, as found in Nepal. More research on this new topic would offer additional insight into this heretofore unexplored issue.

6. REFERENCES


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