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### INFORMATION COMMUNICATION TECHNOLOGIES FOR GENDER AND DEVELOPMENT

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# Christobel Asiedu

## INFORMATION COMMUNICATION TECHNOLOGIES FOR GENDER AND DEVELOPMENT

A review of the literature

*This paper reviews debates, approaches, and discourses on gender, technology and development. The aim is to contribute towards the understanding of the nature, concerns and contributions of ongoing research in the gender, information communication and technology for development field. It outlines the major themes and methodological approaches to the field by reviewing and calling for changes in the theoretical and empirical directions of this area of study. It concludes with analysis of major themes emanating from the field.*

**Keywords** iCT4D; information communication technologies; gender; empowerment; development; postcolonial theory; global south; technological blending

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### Introduction

This paper reviews current research on the relationship between gender, technology and development. It specifically examines the gender and the ICTs for development (ICT4D)<sup>1</sup> literature. New information communication technologies (ICTs),<sup>2</sup> are targeted by development organizations and researchers to address development issues affecting the global south. Historically, the development literature has documented the use of technology for modernizing economies, for industrialization, for political participation and social development. Technology and money were seen as the two 'engines of progress' of world development (Crewe & Harrison 1998). Thus, technology was at the core of the development agenda to modernize developing countries. However, the development discourse, for a long time ignored the role of women in the

development process. When new technology was introduced for development purposes, women were not part of the target group. For example, in Africa, the introduction of agricultural technology in the 1960s and 1970s overlooked the indigenous knowledge of women farmers (Boserup 1970; Stamp 1990; Staudt 1990). Women farmers in Africa were negatively impacted by agricultural technologies because the experts ignored their role although women formed nearly 80 percent of farmers in sub-Saharan Africa. Nevertheless, with regard to ICTs, there has been a call from the beginning to provide women with access to technologies. In fact, development organizations including the United Nations (UN) have been at the forefront of addressing gender issues in ICT4D. According to the UN, access to ICTs is the third most important issue affecting women in developing countries apart from poverty and violence against women (Hafkin & Taggart 2001). ICTs have been touted to empower women economically, politically and socially (Huyer 1999; Hafkin 2000; Harcourt 2001; Nath 2001).

Despite the rhetoric of the potential use of ICTs for women's empowerment, a number of barriers to using ICT services for most women in the global south remain. Some of these challenges include socio-cultural attitudes, illiteracy, and the lack of infrastructure as the majority of women live in rural areas (Hafkin 2000). Most women, relative to men experience higher rates of illiteracy. There are also financial constraints, since the majority of women tend to have lower incomes. Other structural barriers include lack of time availability and limited leisure time (Hafkin 2000; Gurumurthy 2004). Moreover, there are problems with content as Internet use at computer centers tend to be utilized for pornographic use, sexual exploitation or violence (Hafkin 2000). Also, the lack of women's participation in leadership positions as workers in the information society provides grave challenges for them. Since women tend not to be in positions of power, they are unable to make critical decisions to address gender issues in the field. To overcome these barriers, the gender and ICT4D discourse has focused on giving women access to technologies to participate in the ICT4D field and to close the gender digital divide.<sup>3</sup> The empowerment of women via ICTs is therefore purely defined in terms of access without regard to relevancy and control of content.

Access to ICTs as a major objective, informs the three major areas of concern for gender and ICT4D projects, identified in this paper. The three areas are, ICT policies and regulations; connectivity issues dealing with infrastructure needs; and finally, the provision of ICT services, including e-commerce, e-learning, e-government, and telemedicine among others. These three major areas are intertwined and share a common goal of addressing development issues and encouraging socio-economic growth in the global south. The two areas where gender issues have been examined thoroughly are ICT policies and the provision of ICT services to achieve development. Thus, this review focuses on these two areas.

I outline the overall rhetoric underpinning the gender and ICT4D literature, as reflected in the two main areas of research. I examine the theoretical and methodological approaches utilized and suggest future directions for research. In terms of theory, I call for critical studies that address issues of power and inequality inherent in the transfer of ICTs from the north to the south. I particularly, suggest the use of a postcolonial perspective to fully analyze the gender and ICT4D literature, because it provides a critical lens to highlight not only power relations, but also intercultural encounters underpinning the design and engagement of ICTs. Sustainability of ICT projects has been identified by numerous authors as a significant factor in ICT4D research. As noted by James (2005) and Unwin (2009), ICTs are not sustainable unless users appropriate the technology in some way, as it has been done with traditional ICTs, particularly radio. Through the appropriation of the radio, the community radio was formed to allow for local input. Similarly, videos were appropriated to create participatory video projects where content was created by local communities (Heeks 2008). Therefore there should be a corresponding appropriation of ICTs to make it relevant and sustainable in local contexts. The methodological approach suggested, is the use of action research, which is an important methodology in feminist research. The use of action research is particularly crucial as it involves the active participation of local communities in the research process, and ensures longevity of ICT projects. In terms of future directions for research, the nascent research on mobile technologies for development provides us with avenues to find creative ways of blending old and new technologies to address concerns with sustainability of ICT projects. In the conclusion, I present an analysis of consistent themes as well as conceptual issues emerging from the literature. The first is the fusion of the term gender with women. This conflation underlies the discourse used in the gender and ICT4D field. I also examine the presence of intercultural and power relations underlying the ICT4D discourse, and finally the importance of making ICTs relevant and sustainable to be utilized effectively as tools for gender and development.

## **Gender, ICT policies and regulation**

The first major problem identified in the gender and ICT4D field is with regards to ICT policies and regulation. ICT policies are described as ‘an integrated set of decisions, guidelines, laws, regulations, and other mechanisms geared towards directing and shaping the production, acquisition, and use of ICTs’ (Marcelle 2000, p. 39). The overall aim is to reduce the potential of ICTs to create economic and social exclusion by increasing access and addressing barriers that create the gender digital divide (Marcelle 2000). Formulating ICT policies to respond particularly to constraints faced by women, has led to the focus on the inclusion of women in ICT regulation. This inclusion could be achieved in two ways: first,

by promoting women into top governmental structures to be responsible for ICT policies; and second, by incorporating gender issues into ICT policies and regulations.

According to Jorge (2006), it is imperative that gender awareness is part of ICT policy-making and regulation to ensure that women and other marginalized groups become important players in ICT services. In national and international levels, gender advocates have been vocal in influencing ICT policies from organization such as the UN and the World Summit for Information Society (WSIS) (Hafkin 2000). For example in the WSIS Declaration as well as the Plan of Action, gender advocates played a major role in ICT policy at the international level. As stated by paragraph 12 of the Plan of Action:

We affirm that development of ICTs provides enormous opportunities for women, who should be an integral part of, and key actors, in the Information Society. We are committed to ensuring that the Information Society enables women's empowerment and their full participation on the basis on equality in all spheres of society and in all decision-making processes.

The promotion of gender in ICT policy-making at the international level trickled down to ICT policies at the regional and national levels. ICT policies taking into account gender awareness promoted economic participation of women in the information economy, a democratic media, and the use of ICTs to address women's rights issues, including violence against women. Here, the key point for advocates for gender awareness in ICT policies is the argument that the provision of access to ICTs would address the gender digital divide and empower women (Grint & Gill 1995; Rosser 2006). This goal mimics the liberal feminist perspective as well as the women-in-development (WID)<sup>4</sup> approaches to development, which perceives the inclusion of gender issues into institutions and policies as creating gender equity. The argument is made, that equal access leads to the democratization of ICTs. However, there have been critiques against focusing on access to technologies, without taking into consideration the multiple identities of women. These identities play a significant role in determining one's access to technologies (Asiedu 2007). One example of ICT policies focusing solely on access is the creation of Telecenters.<sup>5</sup> It has been noted by authors such as Huyer (1999) that attention has been paid to hardware (connectivity) and not the content of information, in terms of relevancy and appropriateness of content. Others have questioned whether the focus on access overlooks other issues such as the importance of gender awareness in the design and the application of ICTs (Gurumurthy 2004). The lack of local content produces an enthusiasm gap (Marcelle 2000). This is one reason why women make up a small percentage of Telecenter users because there is an emphasis on connectivity and not content (Hafkin 2000).

According to Marcelle (2000), achieving gender equality in ICTs will require a transformation of the ICT sector not only the integration of gender into ICT policy. Therefore, gender should not be just added on, but used as a critical tool to address power relations in society (Gurumurthy 2004). Perhaps the reason why a structural transformation of the ICT sector might be problematic is that, driven by commercial interests, stakeholders in the sector are not interested in tackling the impact of technology on gender and social inequality in society. Aside from commercial interests, there is also the question of the gendered nature of this sector and how that influences the construction of gender. Thus, Hafkin (2000) notes that for a gender sensitive ICT policy to be successful, it is important to generate sex-disaggregated data to evaluate access, usage, content, employment and education, since there is a differential effect on women and men in terms of development interventions.

### Gender and ICT services

The discourse about ICT services takes the progressive transformation perspective that reflects a widespread understanding of ICT as an instrument for economic and social gains (Avgerou 2010). As noted by authors such as Marcelle (2001); Hafkin (2000); Rathgeber and Adera (2000); Garrido and Roman (2006), ICTs play a positive role in addressing political and social development, and would aid the global south to leapfrog over other development stages. There is, therefore, a thread of technological determinism<sup>6</sup> surrounding the potential of ICT4D. The statement below captures the discourse of technological determinism by the UN:

A technological revolution is transforming society in a profound way. If harnessed and directed properly, information and communication technologies (ICTs) have the potential to improve all aspects of our social, economic and cultural life. ICTs can serve as an engine for development in the 21st century, and as an effective instrument to help us achieve all the goals of the Millennium Declaration . . . .<sup>7</sup> (Kofi Annan, UN Secretary General)

As indicated in the above statement by the former UN Secretary General, technology is often seen as the panacea to the problems of development. The ICT4D literature has been positive about the role of ICTs to address economic, political and social issues in developing countries (Hafkin 2000; Rathgeber & Adera 2000; Marcelle 2001). Development organizations, including the UN have proclaimed how ICTs are supposed to transform societies and bring about social justice and gender equity, especially in the field of women's rights (Tandon 1999). According to Nath (2001), ICTs open up direct windows for women to the outside world. As a result, the number of development programs designed to address the

information technology gap between rich and poor countries (also known as the digital divide) has grown tremendously. Third world<sup>8</sup> women, especially are a strong focus of these programs because it is believed that ICTs can aid them to leapfrog over other development stages missed (Knight 1995). The literature on ICT services has been divided into three major areas: ICTs for economic empowerment, e-governance and civil society, and networking for collective action. Below I describe briefly the three ICT activities aimed to empower women who dominate the literature.

### *ICT services and economic empowerment*

It is important to note that the rhetoric about providing ICT services for women is centered on the discourse of empowerment (Huyer 1999; Hafkin 2000; Harcourt 2001; Gurumurthy 2004). Women's empowerment has become a hegemonic concept in the development literature, and features largely in the rationale for creating access to ICT4D. Most of the literature stating the benefits of ICTs, especially to women in developing countries, takes the empowerment approach. Some authors (Castells 1996–1998; Hick *et al.* 2000) point to ICTs contribution to the political empowerment of women and how the Internet has played a crucial role in disseminating human rights abuses faced by women all over the world. Others (Gittler 1996; Hafkin & Taggart 2001) focus on how ICTs enhance the overall participation of women in the development process. Sweetman (1998), however, cautions that there is concern about developmental organizations targeting women as simply users of technology without promoting gender equity but to suit other agendas. For instance, such organizations may have a corporate agenda, mainly based on commercial interests, and therefore use ICT efforts as means of integrating local and national communities into global capitalist systems. Avgerou (2003) and Asiedu (2009) critique the utilization of ICTs as an instrument of economic and social gains only within the context of a market regime. Asiedu provides data showing that for UNIFEM, majority of their ICT projects are geared toward economic empowerment.

According to Bisnath and Elson (2000), the word empowerment is used by neoliberals as a tool for self-help participation in the development process. Although the concept of empowerment in the ICT4D literature remains undefined, the focus is almost always on economic empowerment which assumes that power comes automatically through economic strength (Everts 1998; Sweetman 1998). The ICT4D discourse as noted in the literature replicates assumptions made about the link between gender and technology in the mainstream development literature. Here, empowerment is defined solely as economic freedom (Huyer 1999). Thus, the focus is to transform third world women into economically productive and autonomous women. Hafkin and



Taggart (2001) make the case for ICTs for the economic empowerment of women by stating that:

Information Technology can assist women's economic activities in farming, rural development, trade, business, and industry in a variety of ways. For example, female farmers could greatly increase productivity with access to information on improved agricultural inputs, weather, markets, new production techniques, and farming technologies. Traders and other entrepreneurs also could benefit from marketing information and the opportunity to disseminate information about their businesses. (Hafkin & Taggart 2001, p. 10)

Mitter and Rowbotham (1995) argue that the liberating aspects of technology that gives women economic power should not be overlooked. Mies and Behnholdt-Thomsen (2000) go to great lengths to advocate for a move away from the instrumentalist view of technology to a subsistence perspective, where unequal gender relationships are not reinforced, but social justice becomes the goal. This 'subsistence perspective' promotes grassroots participation and the control over technology by local individuals and communities. The equation of gender empowerment with neoliberalism is important, precisely because gender equality is defined in this context as economic equality. One of the activities highlighted by numerous case studies has been the market for call center jobs held primarily by women. Nevertheless, data collected about women in the information technology field show that there has been a pattern of gender segregation in the information economy (Gurumurthy 2004). Women are underrepresented in senior management of information technology companies. Majority of them tend to be employed as data entry clerks who manage low-level transactional enquiries. Very few women, mostly the small educated elite are employed as computer analysts (Hafkin & Taggart 2001).

Schech (2002) argues that:

In many ways the Internet symbolizes the new development orthodoxy of market-led decentralized development, presenting itself as the technology of our age, with a non-hierarchical structure and capacity for cross-cultural communication, rather than mere top-down diffusion. (p. 16)

Main (2001) captures critiques leveled against the focus on economic aspects of ICT4D projects:

It is difficult ... to see how market-driven Internet development can go beyond the small groups that constitute the professional classes. Do we need to take care that the Internet revolution does not create a knowledge caste system? Such a system could further widen the gap between the well-educated elite and the poorly educated masses. ... (pp. 83–97)

As economic development (impelled by corporate interests) often creates new sites for investment and cheap labor, it opens the door for the participation of individuals, especially women who are seen as a source of cheap labor in the market sector. Thus, private and corporate interests in ICT projects intertwine with the focus on economic aspects of empowerment in ICT4D projects. According to Robbins (2002), partnerships between development organizations and private corporations in ICTs have created a blurred line between development planning, foreign government and commercial interests in Africa. The problem with private corporations featuring highly in gender and ICT development programs in the global south, particularly in Africa is that it brands African women as consumers of western communications products, and not as citizens who strive for equality (Robbins 2002). Thus, ICTs are not utilized for active social participation of women, but to fulfill certain corporate agendas (Senker 2000).

### *ICTs and e-governance*

Using ICTs for greater citizen participation has been targeted by development organizations and ICT advocates to ensure the full participation of women in civil society and engagement with public policy (Nath 2001; Martinez & Reily 2002). Avgerou (2010) describes it as a 'significant tool for achieving efficiency, transparency and responsiveness' (p. 6). There are numerous factors accounting for the lack of participation of women in governance. Among them include social isolation from mainstream activities (Acharya 2003). ICTs create access to government services and enable women's participation in the public sphere. By putting government services online, it cuts down on the time necessary to travel to government offices and to stand in line for services. As information, such as the names of government officials, their roles and responsibilities, working hours, as well as downloadable application forms are posted online, it provides citizens with direct access to government services. Thus, ICTs assist women to contribute more meaningfully to the democratization process by making available, civic information to enhance the participation of women in governance and civic rights (Opoku-Mensah 2000). In addition, e-governance leads to active communication with governmental officials, thereby generating greater accountability and transparency (Nath 2006). ICTs do not only lead to capacity building for women, it also promotes the building of alliances for concerted action. The creation of virtual communities addresses geographical boundaries to alliances (Nath 2001).

There is, however, a debate about the impact of e-governance on citizen participation and governmental decision-making (Riley 2003). One group notes the positive effect of e-governance on individuals and communities. The other group argues that ICTs have little impact on the participation of individuals and groups in governmental activities. Part of the debate revolves around the question of

whether most projects are focused on delivering government services in a more efficient manner, rather than creating opportunities for citizens to be involved in the decision-making process and increasing transparency. Acharya (2003) argues that, poor women may find it difficult to overcome social barriers and to benefit from e-governance initiatives. One important barrier is illiteracy. Unlike traditional media such as radio, which is oral and broadcasts in local languages, information on the Internet is primarily in foreign languages, mostly English. It also requires the ability to read. Thus, it eliminates a vast majority of populations in rural areas in developing countries, who tend to be women. Accessing this information might be time-consuming as well. Sreekumar (2007) critiques the notion that e-governance would lead to a transformation of a top-down approach to governance. Using a case study of a project in India, the author reveals how local managers, including village elites play an increasingly critical role in the implementation of e-governance projects. Thus, projects end up reinforcing the status quo and existing power relations, rather than leading to local or grassroots participation of majority of citizens. Madon (2004) notes that although there has been evidence of e-governance projects empowering women by allowing them to network and socialize with each other, what has been missing has been the evaluation of whether the needs and priorities of communities have been met. According to Madon, a majority of e-governance projects have been evaluated based on the following criteria: access, expenditure, ICT skills and infrastructure. He calls for an important alternative, namely the capabilities approach. This approach based on Sen's concept of capabilities evaluates e-governance projects based on whether the needs of the community have been realized. This approach is more likely to lead to accountability and transparency of governments. For example, the capabilities approach was employed in an e-governance project, whereby women identified freedom to form social networks as an important functioning. Here, Madon reiterates arguments made by other authors about the need to evaluate ICT projects from the point of view of local communities. Good governance is an important tool to addressing developmental challenges (Heeks 2001). The participation of citizenry is at the core of good governance. It is, however, not clear if e-governance projects in the long-term achieve this core value.

### *ICTs, networking and collective action*

ICTs have created new spaces for women to access knowledge, transform it, and network across borders. It has also assisted women to actively participate in social movements. Thus, although empowerment has been equated with economic activities, there is a body of research showing the use of ICTs for social and political activism (Castells 2000; Hick *et al.* 2000; Rathgeber & Adera 2000; Marcelle 2001; Garrido & Roman 2006). One important area of concentration is the use of ICTs by feminist organizations to collaborate

and build social movements around human rights. According to Gittler (1996), women's organizations worldwide are actively using electronic communications to network, to organize and to influence policy agendas on issues of concern to women and to the world. Transnational Feminist Networks (TFNs) have used the opportunities afforded by globalization processes such as ICTs to not only network, but also to extend solidarity, build organizations and movements, to address inequalities, crises, and other negative entailments of globalization. Moghadam (2005, p. 18) describes TFNs as 'manifestations of globalization from below, reacting to the inequalities and injustices of globalization from above'. TFNs engage in information exchange, research collaboration, lobbying and advocacy toward the realization of their goals. They often work with or through international organizations such as the UN to advocate for women.

The 1990s saw an increasing numbers of feminist networks engaged in research, advocacy, lobbying and cross-border solidarity. The development of ICTs led to the creation of feminist networks where transnational social spaces/linkages were created among political actors across borders (Moghadam 2005). Consequently, the communications revolution facilitated the formation and especially the activities of TFNs. Moghadam (2005) summarizes the benefits of ICTs for TFNs:

New ICTs have allowed transnational feminist networks (and other women's advocacy networks) to retain flexibility, adaptability, and nonhierarchical features while also ensuring more efficiency in their operations. (Moghadam 2005, p. 17)

Women in information and advocacy networks through websites, electronic forums and email distribution have joined forces to fight for women's rights (Garrido & Roman 2006). ICTs also provide networking opportunities for women organizations to share information with local and global organizations to enable collaboration on gender issues. According to Castells (2000), in the past, networks were weak at mobilizing resources and focusing those resources on the execution of a given task; functions that large, centralized apparatuses were able to perform more optimally. This has changed with the development of new ICTs epitomized by the Internet. One example of this was in the process leading up to the 1995 Fourth World Conference on Women, where feminist networks played a substantive and significant role in influencing both the process and the policy documents that emerged from preparatory activities and conferences. The use of ICTs contributed to the effectiveness of efforts to influence the policy process. Women around the world downloaded UN documents and circulated it with their critiques. Feminist networks were present at both the official, intergovernmental conference and the NGO forum, and their representatives actively lobbied delegates (Moghadam 2005).

It is important to point out that non-literate, rural women are not actively involved in networking and the barriers to their inclusion should be addressed. Moghadam asserts that despite the fact that feminist networks have a majority of members who are middle-class, and highly educated, they have extensive connections with poor women and grassroots women's groups. Also, although they may be distanced from the concerns of working-class and poor women, given the important objective of these groups to challenge the ideas, attitudes, policies, and decisions of large sophisticated organizations, including international financial institutions and state agencies, the presence of highly educated women as advocates of alternative economics and of women's human rights is necessary and effective. With regard to the problem of non-participation in networking by non-literate women, Desai (2009) asserts that ICTs enable women to create 'new cultures of globalization'. According to Desai, ICTs allow women including illiterate and rural women to engage in cultural creation, by weaving their cultures with other cultures to create new cultures of globalization. The culture of globalization requires participation, interactivity and connectivity to create cultural citizenship. This requirement although significant, is missing in specific ICT projects, as attention has been paid on access and not on active participation. One important mechanism by which the impact of ICT projects could be measured, especially in the grassroots is through networking. Nath (2001) proposes partnership networks involving actors such as women's NGOs to undertake a *planned intervention* (strategically using ICTs to empower women by taking a number of steps including the translation of products and services to non-literate women, and customizing information for local use). It is clear from the critiques leveled against gender and ICT services, that there are major theoretical and methodological issues to address. In the next two sections of the paper, I examine some of the conceptual and methodological problems underpinning this field and identify future directions for research.

### **Theoretical direction of the gender and ICT4D field**

The ICT4D field is multidisciplinary and draws from library and information sciences, communication and information systems, and development (Warschauer 2003; Heeks 2007). There is, however, a lack of theoretical direction of research as the literature focuses on some fields and not others (Raiti 2006). Raiti notes that despite the multidisciplinary nature of the field, the literature is less informed by media studies<sup>9</sup> and heavily drawn from development studies. On the other hand, Heeks (2007) observes that there is very little work drawn from the development field, despite the benefits of employing a development studies perspective to ICT research. Theoretical perspectives utilized include the modernization theory, actor-network theory, institutional theory, structuration theory and various sociological theories. Nevertheless, Ogan

*et al.* (2009) reviewed the field of ICT4D and revealed the lack of theory in the analysis of field experiences of researchers. The authors thus concluded that most of the research on ICT4D is descriptive, not analytical. Majority of authors in this field utilized the empirical approach without situating results of their studies in a theoretical framework. For the few who employ a theoretical perspective, the modernization approach is used to explain the benefits of communication technologies for development (Ogan *et al.* 2009). Thus, although the modernization approach has been largely criticized, especially by postmodernists and postcolonialists, it remains the dominant research paradigm used by the ICT4D literature. Using the modernization approach, ICTs are touted as significant tools for leapfrogging development (Davison *et al.* 2000); as playing a crucial role in disseminating human rights abuses faced by women (Tandon 1999; Hick *et al.* 2000), and enhancing the overall empowerment and participation of women in the development process (Gittler 1996; Hafkin & Taggart 2001).

The focus on access to ICTs repeats the modernization approach to development rhetoric which assumes that when women are given access to resources, they would automatically benefit from development. This modernist view has been entrenched in the development discourse. The modernization school of development arose from the notion that international mass communication could be used to spread the message of modernity and also transfer the economic and political models of the west to the newly independent countries of the south, and also within the south from urban to rural areas (Thussu 2000). It also suggests that developmental problems could be reduced to technical 'solvable' problems, including the transfer of western technical expertise to the developing world (Nandy 1989; Escobar 1995a; Manzo 1995). According to Escobar:

Development was conceived not as a cultural process but instead as a system of more or less universally applicable technical interventions intended to deliver some 'badly needed' goods to a 'target' population . . . (Escobar 1995b, p. 44)

Based on the assumption that the expansion of production and modern science and technology would solve global social problems (Inkeles and Smith 1974), the technical expert is at the core of the development process. Gajjala and Mami-dipudi (1999) explain that since the Second World War, technological transfer has been seen by many as the one over-arching solution to poverty and inequality around the world. However, technology transfer from developed to developing countries is problematic, and the assumption that 'progress' and 'development' are an inevitable result of science and technology should be questioned (Stamp 1990). In the 1970s, technological transfer occurred in the context of agricultural production in the global south. Most agriculture experts and extension agents were male, trained by male experts. Therefore, male farmers were the beneficiaries of social and technological improvements, as well as recipients of

innovation. Boserup's (1970) seminal work on *Woman's Role in Economic Development*, highlighted the impact of technology on women farmers in Africa which had been ignored by the technology and development literature. Agricultural technology had a profound negative impact upon the ability of women to maintain not only their responsibilities as food producers, but also their position within the family and the community (Stamp 1990). The impact of technology transfer on women in the global-south is summarized by Everts:

The association of progress and power with Northern-designed technology was reproduced in Southern communities, where men were quick to see the advantages of controlling new technology. The change from using indigenous technologies to those designed in the North meant a challenge to the gender division of labour, and in some cases to women losing control of both technological processes and the end product . . . (Everts 1998, p. 3)

This argument by Everts has been echoed in ICT4D projects, where experts are sent from developed nations to address ICT issues in the global south. According to Karelse and Sylla (2000), ICTs are marking new forms of imperialism with information continuing to flow from the developed to the developing world. Underpinning the issue of technological transfer is the reinforcement of the authority and power of the development expert from the global north who became the 'savior' of vulnerable groups (Staudt 1985; Mueller 1987; Parpart 1995). Although technological determinism has been a central theme in social theory, it began to be challenged in the 1970s by the social studies of science and technology literature (Wajcman 2004). The new sociology of technology sets out to demonstrate that technological artifacts are socially shaped, not just in usage but in terms of design and technical content (Wajcman 2004, 2006; Fox *et al.* 2006). When technology is understood this way, it is easier to see how gender is embedded and carried in the design and meaning of technological artifacts as well as users of such artifacts (Fox *et al.* 2006). Underlying the issue of technological determinism and empowerment is the focus on the liberating and neutral view of ICTs. Apart from technological determinism that is inherent in the technology transfer literature, there is also the assumption that ICTs like other technologies are inherently neutral. Based on the critiques against the dominant modernization paradigm employed by researchers, there have been calls for more critical theories to examine the ICT4D discourse (Walsham & Sahay 2006). A group of authors (Silva & Figueroa 2002; Adam & Myers 2003; Aygerou 2003; Madon 2003; Silva & Backhouse 2003; Ciborra 2004; Thompson 2004) have used a critical lens to discuss the ICT4D discourse.

The postcolonial perspective in the ICT4D discourse draws attention to the role of culture in technological narratives (Irani & Dourish 2009). This perspective addresses matters of technological determinism, and the top-down approach to development. The rationale for the postcolonial approach is because ICT4D

issues are intertwined with issues of power and various inequities (Silva & Backhouse 2003). The postcolonial perspective therefore provides a critical lens to enable a deeper understanding of ICT4D issues, particularly in the study of marginalized groups, including women (Silva & Backhouse 2003). It thus provides a theoretical background to addressing the experiences of women in the global south. The postcolonial perspective assists us to understand intercultural encounters involved with ICT transmission. It also helps us to focus on the history and current power relations shaping encounters with technological transfer in development. The term postcolonial does not connote periodicity, but rather serves as a lens to examine colonial encounters that currently shape the contacts between developing and developed countries.

Thompson (2004) and Silva and Figueroa (2002) employ Escobar (1995a) to critique development policies supported by information science interventions by interrogating the meaning of development itself. Escobar's critique of development as a discourse reveals how the pattern of development mimics patterns based on colonial histories. The privileging of western expertise and knowledge, and the displacement of indigenous knowledge in the development discourse is highlighted by Escobar and is evident in ICT discourse as well. Escobar's work informs us that empowerment via technology should be analyzed within the intersections of neoliberal discourse and colonizing tendencies. Madon (2003) and Zheng (2007), drawing from Sen, critique the meaning of development that equates economic progress to development, by redefining development as capabilities and having freedom to set and pursue one's own goals and interests. In the application to ICTs, one of the key aspects of capabilities is inclusion. Inclusion is not just about gaining access to ICTs, but using ICTs to achieve certain goals. This perspective does not assume that access to technology would automatically lead to improvement in well-being. Without the active participation of users in utilizing ICTs to address aspirations and needs, ICTs would not offer the opportunity to develop one's capabilities. A number of authors have utilized postcolonial perspectives and drawn particular attention to the importance of power relations in their description of the interaction between the developing and the developed world through ICT adoption and use. According to Liu and Westrup (2003), theories of power assist us to understand the relationship between the global north and the south in the transfer of new technologies. Silva and Westrup (2009) point out that ICTs developed in the north have been framed within certain assumptions that become problematic when applied to the south. Using the postcolonial perspective, Adam and Myers (2003) note that in the ICT4D field, colonial influences persist in the third world. These influences are reflected in dependence on software and other computer systems from abroad.

All the authors that have been noted earlier have examined the ICT4D field in general, but have not paid specific attention to gender issues inherent in this discourse. I suggest that postcolonial feminists including Mohanty *et al.* (1991),



Mueller (1991) and Parpart (1995) would offer important ideas to address gender and ICT issues facing the global south. Postcolonialist feminist critiques of development provide a deeper understanding of development discourse, about third world women and the needed relevance to third world women's experiences and analyzes. Technological access from western countries carries with them a western economic ideology, a neoliberal one which argues that development means increased productivity through large-scale, capital-intensive enterprise (Stamp 1990). Also, the neoliberal agenda to turn third world women into autonomous women (as individuals who need to change their actions to achieve development goals) reinforces the authority of experts. Postcolonial feminist analyzes of development assist in understanding the foundations of the promotion of neoliberal ideologies in the ICT discourse. In addition, the postcolonial perspective also analyzes the construction of language in the development discourse. It challenges essentialism and universalism underlying the rhetoric used to describe third world women. Mohanty (1988, 1991) argues that empirical work on women in the South has not transcended Orientalism's preoccupation with essentialism. However, western lenses have interpreted women as powerless, passive or the 'other' and the image of third world women is essentialized through these representations. Third world women are represented as having 'needs' and 'problems' but faced with few choices with no freedom to act and helpless victims to be saved from poverty (Parpart 1995). In the case of ICT4D, they are defined as barriers to ICT use, because of their circumstances (illiteracy, poor, located in rural areas). This representation of third world realities has provided the rationale for development experts' belief in modernization, which has discredited and subordinated local techniques, knowledges and practices. As documented by Karelse and Sylla (2000), new ICTs are dislocating indigenous knowledge produced by women. This paper therefore calls for the development of gender and sociological theories, political economy and particularly, postcolonial studies to be applied to the field of gender and ICT4D.

A key issue linked to ICT4D research is the appropriation of ICTs. The modernist explanation of empowerment defined mainly as access to technologies, overlooks the significance of active appropriation of technology to ensure its relevance in the everyday lives of women (James 2005). Recent research in the ICT4D field has focused on the need for appropriation of ICTs. According to Michiels and Van Crowder (2001), although ICTs have been touted as providing key information to poor and rural communities, it is primarily because they have been appropriated by those communities. Local appropriation of ICTs is about communities and groups selecting and adopting communication tools and then adapting the technologies so that they become rooted in their own social, economic and cultural processes (Michiels & Van Crowder 2001). Local communities have been able to appropriate old information technologies such as radios and videos, but not new ICTs (Riano 1994; Primo 2003). Thus, Riano calls for the appropriation of new ICTs such as the Internet:

The conventional description of communication technologies identifies them as inaccessible, expensive and complex technologies that require professional expertise and male-gendered technological abilities. Women's participatory communication experiences question this idea, promoting participants' use and manipulation of the technology. The process helps participants become critical of the technology instead of accepting it or taking its content for granted . . . (Riano 1994, p. 27)

The topic of appropriation of technologies as a result of participatory involvement in ICT4D projects presses the need to utilize new methodologies to effectively assess the impact of ICTs on the lives of local communities.

### **Empirical direction of gender and ICT4D research**

Much of the research on ICT4D employs case studies and qualitative research methods (Walsham & Sahay 2006). However, Raiti (2006) and Ogan *et al.* (2009) note that the emphasis has been on quantitative methods. Despite the opposing views concerning the empirical focus, Raiti calls for new models of analysis that are not quantitative and qualitative methods. Although there is corpus of research outlining the benefits of ICTs as tools for economic, social and political empowerment as outlined earlier in this paper, there is an alarming lack of empirical evidence or analyzes of actual experiences of applying ICTs locally and the impact upon people's economic and social lives. There have been a number of projects though examining the impact of ICTs on the lives of individuals and groups in the developing world. A number of studies including research conducted by Anderson and Shrum (2007) as well as Palackal *et al.* (2007) show the use of ICTs by women scientists to challenge gender codes in India. Nevertheless few projects pay attention to the monitoring and evaluation of ICT outcomes, especially at the local levels. Michiels and Van Crowder (2001) recommend the use of strategic content to ensure that ICTs can be locally appropriated to affect development. Community assessments of ICTs are rarely performed prior to ICT applications, especially in the case of community telecenters built without local participation in the creation of content and selection of ICT tools. Thus, priorities tend to be external to the needs of the local population and instead reflect the interests of funding agencies. The research on telecenters mostly operates from the assumption that telecenters would have a positive impact on communities and address the digital gap between the poor and rich (Avgerou 2010).

Michiels and Van Crowder (2001) calls attention to the limited numbers of cases of community-driven locally appropriated ICT initiatives or projects. However, the few that do, receive scant attention in part because they are not donor-driven. Also most of the community-driven projects are relatively new

and therefore it is difficult to measure the impact or sustainability of these projects. For those that have been in operation for a relatively long period, there is lack of monitoring and assessment of these projects. A review of case studies shows that there is not much known about local appropriation and how it works in terms of how it is initiated, maintained and perceived by the local community (Michiels & Van Crowder 2001). Therefore, there is a pressing need for 'socially and culturally responsible connectivity' strategies (Michiels & Van Crowder 2001). These strategies should look beyond merely providing access and instead embrace a more holistic approach by fostering equitable access, meaningful use of ICTs and the encouragement of community and group self-empowerment through local ICT appropriation. Also, more cross-cultural research teams are needed to conduct research because cross-cultural research embrace local and indigenous participation as well as outside groups that bring new perspectives and approaches to the local field situation (Walsham & Sahay 2006). Robbins (2002) calls for an integrated approach with a strong focus and involvement of rural communities. This integrated approach should focus not only on economic, but political and social empowerment as well.

In terms of the empirical direction in the literature, there have been debates surrounding the potential use of ICTs for empowering groups, or individuals. Development projects targeted by organizations such as the UN show a neoliberal agenda where structural problems are turned into individual ones, and individual women's access to ICTs is seen as the solution to developmental problems. Individual empowerment perceives social change as a set of economic conditions and choices realized at the individual level. Martinez and Reily (2002) make the point that the capacity for ICTs to empower women to be actively involved in their information needs would depend on a collective (group) and not on individual empowerment. Collective empowerment ensures that women are not just users, recipients and consumers of ICTs, but also social and political actors seeking to participate in policy and decision-making. When there is collective empowerment, women are organized and would better articulate the type of information they need (Martinez & Reily 2002). In addition, Opoku-Mensah (2000) criticizes the use of ICTs for individual empowerment by noting that connecting individual rural women directly to the Internet is impractical in most of the developing world, especially Africa. However, providing ICT services to a range of women's groups would ensure that collective empowerment takes place. For example, women's groups could act as information facilitators for rural women. As noted by Wilkins (1999), focusing on individuals draws attention away from critical structural influences. Also, the neoliberal agenda to turn third world women into autonomous women (as individuals who need to change their actions to achieve development goals) reinforces the authority of experts. On the other hand, Hafkin (2000) in her research and analysis

of *InfoDev* projects on ICTs documents the value of not only economic empowerment for individual women, but also the enhanced sense of self-esteem experienced when individual empowerment is pursued.

Current research in the area of ICT4D has pushed for the blending of old (such as radio) and new (example the Internet) technologies, also known as technological blending (Girard 2001, 2003; Contreras 2003; James 2005; Minges 2006). Technological blending is a way of ensuring that the benefits of new ICTs are expanded to the majority of the population, who are marginalized in the development process. As a result of barriers to the use of ICTs in developing countries, combining a popular medium such as the radio with the Internet ensures an egalitarian benefit to the use of ICT4D by reaching more people. Old technologies such as the radio and television are still very popular. According to Jensen (2002), the community radio is more popular with women in Africa than other forms of information technologies. When ICTs such as the Internet are blended with old ICTs such as the radio, it allows for active participation of users, and a bottom up approach to the use of technology. By involving the community, a bottom-up and not top-down approach is enforced. Combining ICTs with radio might offer a more effective way of introducing new technologies to make it meaningful and attractive to the marginalized in society. Local appropriation of ICTs is important because it does the following: it contributes to reducing the digital divide; give a voice to the voiceless; fosters and facilitates community decision-making and action and empower people to take control of local development processes; advances community ownership of ICT4D; and ensures that ICTs serve the purposes of local communities (Bachelor & O'Farrell 2003). Through appropriation, communities select and transform technologies and content to fit their needs, rather than reflect the interests of external groups.

There have been innovative case studies in the global south, of blending a popular medium such as the radio with the Internet to reach a larger audience. One case study is the Feminist Interactive Radio Endeavour (FIRE) created in 1991 in Costa Rica, as an Internet Radio initiative to broadcast women's perspectives on issues and events around the world (Primo 2003). It makes the case that making use of the radio is a powerful means of increasing the reach of ICTs because it addresses problems of both physical access to ICTs and content as well (Radloff & Primo 2002). Apart from integrating the Internet into radio programming, it allows for the incorporation of relevant global information with local information. To cater for the needs of African women in particular, the Women's International Network of the World Association of Community Broadcasters (AMARC)<sup>10</sup> has developed a program that educates women about how to use ICTs creatively in community radio. The training content aims at introducing African women in community radio to their respective communities and countries to create a grassroots, and a local to national flow of information.

The radio is used as a bridge to the Internet as information is exchanged between the two channels (Wanyeki 2002).

It is important to note that in terms of technological blending, one of the new directions in the research on ICTs in the developing world is mobile phone technologies. The International Telecommunication Union (ITU) estimates that 90 percent of the world population now lives in areas with coverage. In many developing countries, mobiles represent well over 90 percent of all available telephones (ITU 2010). Mobile phone use has been growing particularly in sub-Saharan Africa. The benefits of the use of mobile phones have been numerous, including increasing mobility and saving time from traveling long distances to see relatives or for business. In terms of economic activities, access to mobile phones makes it possible to directly communicate with business partners without going through third-party business people or 'middle-men'. This cuts down on costs and gives entrepreneurs, particularly women more control over their business dealings (Buskens & Webb 2009). Feminist organizations also benefit from mobile phones by using it to network. There is evidence that using mobile phones for networking is much more effective than using the Internet (Abraham 2009). Buskens and Webb (2009) reveal that unlike computer-related ICTs, mobile phone use has been appropriated by many rural and non-literate women. The use of mobile phones is particularly relevant for oral cultures, and thus it is not surprising that it has been utilized heavily in sub-Saharan Africa, even for those in rural areas. Thus, in the future, more research needs to be conducted about blending mobile phones, with other communication technologies to effectively achieve development goals. Nevertheless, one problem with using mobile phones is cost, in terms of buying phone units to make calls. Mobile phones rely on continuous communication which demands constant purchase of phone units (Abraham 2009). Raiti (2006) draws attention to capitalistic tendencies to create as many consumers as possible in the push for mobile phones in developing countries.

For methodological directions, Walsham and Sahay (2006) call for the need for action research. According to Reason and Bradbury (2001), action research is:

a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview which we believe is emerging at this historical moment. It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities. (p. 1)

Action research is participatory in nature and adapted to the local context. When researchers employ this methodology, they work equally with local

residents to identify and address development problems. This methodology is relevant to studying marginalized groups with scarce resources, such as women in developing countries. This is an important methodology used in feminist studies, with the aim for researchers to make specific contributions in the research setting itself. Action research as a participatory process embraces the idea that knowledge is socially constructed, and allows local communities to determine the agenda, rather than experts. This is in line with postcolonial feminists' arguments about the need for local women to be actively engaged in the development process. Song and Vernooy (2010) revealed how through action-research, rural women farmers in China were organized to access technology in a sustainable way. The authors collaborated with women farmers and agricultural scientists. Women farmers participated equally in the research as partners, sharing their knowledge of agricultural practices and expertise. This is an example of using the bottom-up approach to development, instead of the top-down approach traditionally utilized in technology and development projects, where there is a focus on outside expertise. By actively involving local communities and recognizing their expertise, technological projects become more sustainable. For women, it also empowers them as noted by Song and Vernooy's research.

## Conclusions

I conclude this review by identifying and analyzing themes emanating from the gender and ICT4D research. Although in the 1990s, the feminist literature on development moved away from women to gender,<sup>11</sup> there is a sense in the literature that the concept of gender is used interchangeably with women. Gender is constructed and involves a cultural process rather than a fixed identity. This conflation has been difficult to avoid because on one hand, it is understood that technologies are not gender-neutral, but that they are produced and utilized in gendered ways. At the same time, researchers find it imperative to study and document the situation of women's relationship with ICTs. Huyer and Sikoska (2003) note that there is little research and analysis based on the concept of gender. Rather, they are based women's relationship with ICTs. By focusing on women, access to technology is emphasized, as if the problem with women's relationship with technology is because there are few women designers and users of technology. This mimics the WID perspective, often described as the 'add and stir' method of including women into development projects without addressing structural problems involved. As Hafkin (2002b) notes, the presence of women on a project team does not necessarily mean that gender considerations would be incorporated into a project. The focus on women essentializes them across contexts, although women are situated in different contexts based on various hierarchies. In moving away from women to gender, feminists

focused on the intersection of gender, ethnicity and class in relation to development. This approach argued that as a result of class, ethnicity and other social divisions, development programs and strategies affected women in different and varied ways. The concept of intersectionality is profoundly important for development practitioners because they work with groups of people from diverse backgrounds (Currie & Vernooy 2010). When gender issues are defined in terms of male/female, it is assumed that barriers to ICTs faced by women have to do largely with their gender rather than their gender intersecting with their class, ethnicity and social position. Gajjala's (2002) research shows how the processes of gendering shape technological design and its use. Thus, the author calls for technology and gender to be seen as processes that evolve and change, instead of rigid absolutes.

A gender perspective examines broader socio-cultural issues that impact on men and women's relationship with technology. Therefore, Hafkin (2002a) calls for a 'gender lens' to evaluate ICT4D projects. A gender lens enables us to focus on organizational and institutional transformation of structures impinging on gender issues. For example, in terms of ICT policies and regulations, there should be an evaluation of the gendered nature of the ICT sector itself and how it constructs gender in specific ways by focusing on women and their participation in the sector. The focus on gender thus highlights the importance of evaluating structural issues rather than focusing on individuals. At the same time, Anderson and Shrum (2007) reveal that focusing on gender does not necessarily lead to radical structural changes in society. In their research on women scientists' use of ICTs, they show how ICTs are employed creatively to challenge power structures and gender codes. The authors concluded that the focus should not be on the benefits of ICTs *per se*, but rather on how ICTs assist in challenging or circumventing social structures, without necessarily overthrowing them.

In relation to gender, one consistent theme in the literature has been on the barriers to ICTs in the developing world. One important barrier concerns the relevance of content of information transferred from developing to developed countries. It has been suggested in this review that the lack of content creation in the third world is perceived as more important than access. The development of content is crucial and is linked to participation. It is therefore not surprising that community participation has been a recurrent theme in the literature. As noted by Brewer and Gajendran (2006), active local community participation is critical to what happens to projects after the research team leaves. In a project on the impact of ICTs on women scientists in selected countries in the developing world, Shrum (2005) notes that the important question is what happens after technological projects are created. Shrum points out that the relationship between hosts (local communities), and guests (foreigners bringing technological transfer) is transient, as guests leave and have little control over outcomes of projects. This speaks to the

core of the issue, mainly the sustainability of ICT4D projects discussed earlier as an important theme linked with content production. This is because participation and control of ICTs by local communities is more important for the longevity of projects (Heeks 2008). Madon's (2004) use of the capabilities approach in e-governance projects to determine whether the needs of a community have been achieved is significant in identifying issues raised by community members themselves. The use of action research is a useful methodology to evaluate the feasibility of projects as the community is by default actively involved in the research.

Finally, the cultural issue underlying the ICT4D discourse is an important one that has resonated with some authors in this field. I focus on this topic in my analysis of the literature by highlighting the postcolonial perspective, because it draws attention to the role of culture in technological narratives. Among the authors stated earlier, Irani and Dourish (2009) view ICTs as sites of cultural encounters in terms of adoption, use and design of technologies. The postcolonial perspective draws attention to a series of questions that focus on the complexities of power and knowledge in encounters between developed and developing worlds. It critiques the focus on expert knowledge, as local and indigenous knowledge is ignored. This perspective underscores the power relations at play in the process of representation. In a way, the various critiques leveled in the literature with regard to the representation of gender, the gendered barriers to ICT use, the importance of community participation and the sustainability of projects are all informed by the postcolonial perspective. This is because among other factors, the postcolonial perspective highlights the process of knowledge creation and the displacement of local knowledge and experiences. It calls for a community-based technology and the redefinition of knowledge by local communities. The postcolonial approach is a critical perspective aimed at bringing forward the voices and experiences of marginalized groups. It assists us to understand the importance of context and argues against the assumption that women are a homogenous category. It speaks to the issue of neoliberal capitalist values underpinning the ICT4D discourse, specifically through the discourse of women's empowerment. The equation of empowerment with neoliberalism as identified by this perspective is significant, as it draws our attention to gender construction based on one's access to economic activities. When this construction is applied to ICTs, women are seen solely as consumers and not producers of technologies (Robbins 2002). This according to Escobar (1995a) is inherently disempowering. The active use of technologies by third world women in the ICT for gender and development discourse has been an important requirement for sustainability of ICT projects and should continue.



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## Notes

- 1 The ICT4D literature emerged over the last 10 years, to establish the link between ICTs and economic and social development.
- 2 ICTs are defined broadly as 'technologies to access, process and transmit information' (Weigel & Waldburger 2004, p. 19). There are distinctions made between old and new ICTs. Old ICTs referred to as traditional media include radio, telephones, television and radios. New ICTs are mostly Internet based such as computers, email, online and mobile technologies. This distinction is maintained in the paper.
- 3 Gender digital divide is the unequal access of men and women to ICTs. This divide exists in both rich and poor nations, but the gap is wider in poor nations.
- 4 The WID paradigm features highly in the link between technology, gender and development. WID analysis favors technological determinism and the role of experts. It shows underpinnings of the modernization school that privilege the role of technology and experts in development.
- 5 'A Telecenter provides information technology and telecommunications facilities, user support and training for members of a community who cannot afford such facilities on an individual basis and or do not have the skills to use such tools' (Ernberg 1998, p. 191).
- 6 Technological determinism assumes that technology is the engine of progress in society and will solve all development problems in society (Wajcman 1991, 2004, 2006; Jasanoff *et al.* 1995; MacKenzie & Wajcman 1999).
- 7 Speech given at the 2003 WSIS. Available at: <http://www.Geneva2003.org://www.Geneva2003.org>.
- 8 As defined by Worsley (1970), the third world constitutes countries in Africa, Asia and Latin America that were colonized.
- 9 Media Studies concentrates on the role of mass communications in society.
- 10 AMARC is an international NGO that promotes social change through the development of a strong community radio sector.

- 11 Gender is seen as the process by which individuals who are born into biological categories of male or female become social categories of men and women through the acquisition of locally-defined attributes of masculinity and femininity (Kabeer 1994, p. 11).

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