

## **Gendered Perspectives on the Digital Divide, IT Education and Workforce Participation in Kenya**

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### **Abstract**

In this paper, we present a study on gendered perspectives of the digital divide, IT education and workforce participation. Using an interpretive approach, a team of four Kenya- and US-based researchers interviewed thirty-two women and thirty-one men matriculating in an IT program offered by a university in Kenya. Our findings indicate significant similarities in male and female response. Both groups described the digital divide as a complex phenomenon that occurs at individual, national and global levels. However, men were more likely than women to see the divide as bridged as a growing number of Kenyans gain IT access and skills. Both sexes perceived significant opportunities for well paying careers in the IT workforce, and this served as a primary motivator for enrolling in the IT education program. However, women tended to reflect on significant structural barriers, such public policies that failed to facilitate the development of the IT sector, gender discrimination by employers, and training which provided them with insufficient technical skills to enable them to effectively perform in the workplace.

**Keywords:** Gender, Information and Communications Technology, Information Society, Sub-Saharan Africa, Kenya.

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## INTRODUCTION

Much of the discourse on information technologies (IT) and development converges on the empowerment of women. To speak about empowerment, however, necessarily assumes that women are currently disempowered. Women are often challenged by fewer opportunities for employment in the formal economy, lower levels of career advancement and lesser compensation for equal work. Patriarchal structures socialize women to conform to conventional gendered roles that are associated with motherhood, caretaking, and domestic work. Further, Hossfeld (1990) offered that these dimensions can be characterized as the “triple shift” whereby women are involved in paid labor in the formal sector, paid labor in the informal sector, and the uncompensated labor associated with their personal households.

Development policies and programs characteristically utilize IT to advance modernization, promote social and economic development, and improve the status of women. Public policy findings on gender and social inclusion – as published in the *World Bank's 2001 Report Gender and Growth: Africa's Missed Potential* - demonstrated that when women thrive, an entire community, society and/or country gains and experiences along economic, health care and education dimensions (World Bank, 2001).

We borrow from the work of Sen (1999) to conceptualize development. According to Sen, development is a process of expanding the real freedoms that people enjoy. While most developed nations (e.g., the G8) would define a measure of a country's freedom by its gross national product (GNP), this perspective is limited in scope. Personal income provides means to expand freedoms, but Sen expands this notion by including determinants of freedoms, such as health care, education, political and civil rights. Development, therefore, requires the eradication of sources of oppression, such as gender and racial discrimination, social and economic deprivation, neglect of public facilities, intolerance, and over-activity of repressive states. When these sources of oppression are eradicated, individual freedoms are expanded.

In this study we focus on both male and female perspectives on the digital divide and the role of IT-related education and careers in facilitating development in Kenya. Much of the gender research in information systems (IS) focuses on demographic disparities with an emphasis on exclusion of women in the IT workforce and educational pipeline which prepares them for this work. More recently, however, gender has been integrated with studies of racial and ethnic minorities, people living with disabilities, developing regions and economies, and other disadvantaged groups to form comprehensive research areas including the digital divide, social inclusion, and underserved communities. Moreover, these emerging areas are gaining importance in the field as evidenced by the conference theme of social inclusion at the 2006 International Federation on Information Processing Working Group 8.2 (IFIP WG 8.2) conference and underserved communities at the 2006 International Conference on Information Systems (ICIS).

Our guiding research questions include:

1. What are common perspectives regarding the digital divide?
2. How and why have these digital divide perspectives motivated men and women to gain an IT-focused education?

In what follows, we begin by situating our work in extant literature on the digital divide. Next, we describe our research methodology which is based on an epistemology which recognizes both similarity and differences among the male and female informants, and the research team. Our interview protocol and methods for reducing and analyzing data are described as well. We conclude by offering our analysis and interpretation of this data.

## LITERATURE REVIEW

With the development of complex and modern IT, both developed and underdeveloped countries are exploring ways to enjoy the many benefits that these technologies enable (Dutta, 2001; Goodman, 1994; Mbarika et al., 2002; Straub et al., 2001). Sadly, however, a digital divide between developed countries and underdeveloped countries looms large. The digital divide is defined as the “differential capabilities of entire social [or regional] groups to access and utilize electronic forms of knowledge” (Straub, 2003 p. W477), segregating the “haves” from the “have-nots” in the information society. While much discussion on the digital divide has focused on inequality which occurs among different social groups within a single country (Hoffman and Novak, 1998; Payton, 2003; Kvasny and Payton, 2005), we note here the international digital divide between different countries (Straub, 2003). This digital divide is abundantly clear when comparing IT in Sub-Saharan Africa (SSA) with the countries of the West like the US or the UK. For example, while the US and the UK have been enjoying Internet connectivity for more than two decades, Eritrea had its first Internet connection only in 2000. Similarly, and closely related, while the US boasts more than 60 telephone lines per 100 people, many SSA countries still share less than 1 line per 100 people. The use of IT in SSA also lags considerably even when compared to other underdeveloped regions, such as those in Central America.

In a plea at the World Summit on the Information Society, former United Nations Secretary General Kofi Annan (Annan, 2003) called for the US information technology community to involve its innovative dynamism to bridge the digital divide that threatens to marginalize development prospects. The UN has approved \$6 million for the “Internet Initiative” in Africa and a further \$11.5 million for IT projects under the banner of “Harnessing Information Technology for Development.”

Another form of digital divide in Africa is the intra-continental divide. While the more developed Northern and Southern regions of Africa might be able to develop and grasp contemporary IT, as well as other economic development advances, the same is untrue of sub-Saharan Africa that essentially trails North and South Africa. For example, while South Africa enjoys a teledensity of over 10 telephones per 100 people, the sub-Saharan African region still barely has a teledensity of 1 per 100 (Mbarika and Mbarika, 2006).

The third form of digital divide in Africa and even some parts of the US is the “within-country” digital divide (Straub, 2003). In Kenya, our country of focus, women are just now getting increasingly engaged in IT education as well as IT-related careers. These women have historically been given the traditional “stay at home mom” role which, without minimizing its importance, has disenfranchised the Kenyan woman from fully participating in the information age. This segregation within country is not unique to sub-Saharan Africa. For instance, the digital inequity in the American educational system creates a lost cohort of would be skilled, knowledge workers – particularly among lower income and/or Black youth (Payton, forthcoming; Payton, 2006).

## METHODOLOGY

To gain insights into the ways in which the digital divide is experienced in Kenya, we conducted structured interviews with 63 students (32 women and 31 men) enrolled in the Bachelor of Business Information Technology program at Strathmore University in Kenya. All of the informants were in their third or fourth year of study, and were enrolled in the “Social Impact of ICT” course which was being taught by the fourth author. All informants are of Kenyan nationality, recent graduates from secondary schools, 20 to 22 years of age, and mostly single. These were primarily fee paying students who financed their education through work, loans and scholarships. Most have completed or are currently engaged in an internship with a company. These characteristics of the informants are summarized in Table 1.

Number of interviews	64			
Age	20-22			
Year of undergraduate study	3 to 4 years			
Industry attachment (internship)	Completed or in-process			
Length of interviews	20 – 25 minutes			
Female Informants (N=32)	Adhiambo	Anyango	Arusi	Aza
	Badu	Becca	Bibi	Burhani
	Chanya	Dalila	Deka	Desta
	Eshe	Fola	Hasina	Issa
	Kaya	Kesia	Loiyan	Makena
	Marjani	Nazi	Ndila	Neema
	Nyamu	Saada	Selam	Sharik
	Thairu	Wanabui	Zahara	Zalika
Male Informants (N = 31)	Abu	Adem	Ajani	Anwar
	Barke	Belay	Chata	Chike
	Davu	Diallo	Faraji	Gamba
	Genet	Guban	Haruni	Ige
	Jabari	Juma	Kabili	Keon
	Leeto	Mablevi	Makalo	Morathi
	Nyack	Oringo	Polo	Raimi
	Shakir	Taye	Yaro	

**Table 1: Characteristics of Informants and Interview Process**

Interview questions were developed to uncover different expressions of common themes around the digital divide, IT education and workforce participation. The genesis of the full set themes and representative questions are detailed in a prior paper that focuses on the female respondents (Mbarika, et al, 2007). For this paper, we focus on the subset included in Table 2<sup>1</sup>. We selected these themes as a pragmatic way of reducing the volume of data and conceptually to remain consistent with prior studies in developing countries as documented by the Women’s IT-Based Enterprise for Development<sup>2</sup> and the site’s well-regarded case studies by information systems scholars, such as Morgan, Heeks and Arun (2004). Though these studies converge on women’s issues, they offer a foundation for theorizing concepts which inform our research questions.

<sup>1</sup> The complete interview protocol is available by request to the authors.

<sup>2</sup> <http://www.womenictenterprise.org>

<b>Themes</b>	<b>Interview Questions</b>
Definitions of the Digital Divide	In your own words, what is the digital divide? Some people say that the divide has been bridged since we have provided people with computer and Internet access and training. Do you agree? Why or why not?
Motivation for learning about IT	In your opinion, why do men participate in this IT program? What is at stake if you do not learn about IT?

**Table 2: Research Themes and Questions**

The fourth author, a researcher located in a university in Kenya, administered the interviews. During the interviews, each informant received the same interview questions in the same order. Informants were instructed to reply to the questions by anonymously writing their responses in a booklet. We believe that the anonymous nature of the responses along with the informants' established relationship with the interviewer may increase the trustworthiness of the responses. The response booklets were, then, sent to the co-authors in the US for data analysis. This interview process resulted in approximately 130 pages of interview texts.

Two US researchers began by independently reading and coding the interview texts. Texts with similar codes were typed and grouped together for more focused analysis. During focused analysis, we searched for high-level themes that addressed our two research questions: the meaning and impacts of the digital divide as well as motivations for attending course.

## **FINDINGS**

In what follows, we present the thigh-level themes that emerged from our analysis. For each theme begin with female narratives followed by points of agreement and disagreement of male responses.

## **MEANINGS AND IMPACTS OF THE DIGITAL DIVIDE**

The first group of questions focuses on the self-determined meanings of the digital divides. With this question, we were interested in seeing how informants connected issues of social inclusion with IT. It provided a way to hear them talk about their family members and peers who may not have an intimate relationship with technology.

We observed that one woman and seven (roughly 20%) men believed the problem had been solved. Ige's response typified this perspective which sees issues of access and cost as largely resolved. "We have access to the core of IT, the relevant aspects that the digital divide centers on". The remaining informants argued that the divide remains. Looking closer into their responses, we found that the divide existed at the personal, national, and global levels. At each level, disparities such as age, knowledge, use, and policy were structured as binary oppositions such as West/Africa, skilled/unskilled, absence/presence of IT, male/female, behind/caught up, urban/rural and old tech/new technology. This type of binary formulation is consistent with the dichotomies found in much of the prevailing digital divide discourse (Kvasny, 2006; Kvasny and Payton, 2005; Payton, 2003).

At the individual level, the divide was seen as a gap in both access to technology artifacts as well as the know-how to make effective use of these artifacts. Nineteen of the women adopted this standpoint and defined the divide as the difference between "*computer literate and*

*computer illiterate people*” (Issa), *“those who have easy access to technology and those who don’t”* (Selam), and *“those who have some IT skills and those who don’t have”* (Thairu).

Most men framed the digital divide in terms of individual disparities, but the dimensions tended to be broader than those posed by women. For instance, Ajani used age to describe the digital divide as *“the gaping disparities between generations in different parts of the world in regards to their knowledge of IT, the technologies they use, legislation in place and the general understanding of IT issues among the general population.* Cost was only mentioned by Yaro and Raimi, *“Computers can be acquired more cheaply but they are not free. You still need to have money to access them”*(Raimi). Anwar used the dimension of time to construct his standpoint. *“The digital divide is the gap created between the digital age and the traditional age. The digital age includes the use of computers, telecommunications, networks, Internet and the web. The traditional age includes the use of ladders.”* Guban suggested that the features of and physical access to IT artifacts contribute to the digital divide. *“Even if we have been provided with computers to bridge this gap, those computers are of lower technology. Let’s say Pentium ones which have virtually ceased to exist. Thus we can’t say that the bridge has been narrowed. Also the Internet does not help in bridging the gap because of the different ways of accessing this resource”.* Jabari suggested even more factors which include *“the availability of IT resources and awareness of opportunities in IT either between men and women, different geographical regions, educational endowment, or between races”.*

At the national level, a female informant expressed this dichotomy spatially as *“the way that some parts of the country that is the rural areas lack information technology tools while the urban centers have most IT tools”* (Aza Ndila acknowledges: *“Yes we at this learning institution have been provided that but all this is mainly concentrated in the major towns. The rural areas have been left far behind such that the average for the country is quite low compared to that of the developed nations. Thus we cannot say it has been bridged based on the numbers/statistics of the cities”.*). Barke, the only male to discuss the divide from the national level, suggested, *“Even access to the Internet is limited to those who are aware and able to access it. Some places in Kenya ... have no access to a radio, forget the computer!”*

At the global level, women used language such as the gap that exists between *“third world nations and industrialized countries in terms of IT”* (Hasina), and *“developed nations and developing nations in terms of knowledge about IT and how it can be used to better living standards”* (Nyamu). Selam provided a rather fatalistic narrative that speaks to the frustration of being situated in a nation that is always being measured according to Western criteria that are continually expanding. She lamented, *“It will be hard to catch up with the West. In fact, it will be impossible. This is because IT works in levels. You move from one level to the next. And since IT is always changing, by the time we move to another level, the industrialized countries will be yet at another level”.*

Men, such as Adem, offered similar perspectives – *“It’s the fit between those who care IT literate (mostly Western countries) and the ones who are not IT literate (mostly Third World countries).* Polo contended, *“Kenya and the developing world are still behind in technology and IT as the developed world continues to make great strides in IT and technology.”*

## **MOTIVATIONS FOR LEARNING ABOUT IT**

Nearly one-third (10 out of 32) of the women who participated in the IT educational program at Strathmore University did so because they perceived the field as new and exciting with many job prospects. Women believed that there were substantial employment opportunities upon graduation because there were few IT professionals competing for jobs - *“not many*

*people in Kenya have this sort of information [and] this is because currently in Kenya there lacks professionals in this field” (Issa). Not only were jobs seen as plentiful, they were also seen as well paying. Makena, for instance, believed that “IT programs have proved to be more well paying careers than other technical careers in the country. This is due to the wide usage of IT in various sectors such as banking firms. This provides a good basis for the women to work in a different sector while applying their IT knowledge”.*

Men are overwhelmingly motivated by the same career and economic factors as women. *“Men participate in this IT program firstly because they hope to achieve their goal of earning some substantial income after the course” (Morathi). In addition to income generation, men shared a future orientation. “Men do participate in this IT program because IT is currently experiencing vast advancements especially in developing countries like Kenya and it seems that there will be a bright future as we enter the electronic age” (Taye). Only a few men made the argument that IT is a male domain. For instance Chike contended, “IT is the only potentially successful sector in the future of business. And men are more affiliated to risky jobs that normally have high return. Technology are gadgets and dynamics and that is what makes up men’s toys.”*

Two motivators, however, were pertinent for women only. First was the view of IT as a way to engage in entrepreneurship. According to Arusi, *“I want to be a business person in the future. I want to own my own business in Kenya so I need business and management skills. However, I also realize the role of IT in today’s society. I wanted to know how to link the two – business and IT –and how I can use the two to develop my ideas of a business I hope to start”.* In a similar fashion, Deka noted, *“Since I have the basics of IT and my course provides a grounding I can build up on my own, I could start my own enterprise using this knowledge”.* For women, such as Zalika, business ownership was once a dream that now can potentially be achieved. *“Given that I would like to learn IT so that I run my own IT firm in future. If I do not take this chance to learn IT, then my dream will not be accomplished”.* One male informant, Anwar, supported the view that IT could facilitate entrepreneurship for women. *“Women can use IT to improve their standard of living. For example, they can use the Internet to facilitate marketing for products, such as self-help groups to market their ciandos<sup>3</sup>”.*

The second was the view that expressed by 23 women that IT programs could facilitate gender equity. For instance, Badu reflected, *“Since the initiation of gender equality, women have been able to overcome all sorts of challenges and exploit their potential to the fullest. As a result of this there has been more of women participation”.* For her, IT offered an opportunity for overcoming oppression and competing head on with men. Neema stated, *“Gone are the days when there were specific jobs/careers for men and women. Women now want the challenge. IT represented a vehicle that would enable women to engage in a profession which has been historically perceived as a male domain. Chanya observed, “The reason for participating in this program is to broaden the job skill and not stick to the stereotype that certain jobs are for women. IT has impacted many areas and even women realize that there are job opportunities that come with this vast growth. They therefore want to be part of it.” For Tamu, “The simple reason why women participate in this IT program is because men do the same thing. Equality is something that women have all been fighting for and have accomplished their goal. If a man can participate in IT, why shouldn’t a woman do the same thing?”*

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<sup>3</sup> The ciandos are very popular hand woven African female handbags (from sisal), primarily produced by the Kikuyu women of Kenya. More recently, just as many African creative ideas have been “stolen” by other non-African nations, it has been reported that this native Kenyan artifact has been ‘patented’ by Malaysia - to the dismay and heartache of many Kenyans and Africans.

Women also appeared to be strongly influenced by national policies and public discussion which promote gender equity. There was the belief held by women such as Adhiambo that “*women have a better understanding of the technological world so that when we begin our career we will be able to successfully represent other women in our country*”. The desire to represent Kenyan women was also salient in Eshe’s reflections on changing societal norms on parenting girls. “*Due to the empowerment of women in recent years, more and more parents are becoming interested in the girl child and encouraging the girl child to become active in society. More and more women want to play an active role in their society and in the world, and this being the information age, women want to be involved in the IT sector (not to be left behind their male counterpart).*” There was a sense of societal change in the women’s discourse; challenges may exist, but gender relations are improving. For instance, Becca stated, “*As a Black Kenyan woman, it is my decided opinion that women participate in IT programs due to the rising gender awareness in the country. It is as a result of the awareness that women can compete on an equal platform with men, and the Gender Equality Act that we have been empowered to participate in IT*”.

Thirteen (13) male informants supported this view of empowerment. However, some men constructed IT in ways that reproduce established gender roles. “*Women participate in IT programs in order to uplift their knowledge on issues surrounding IT. The knowledge is used to upgrade women projects (i.e. family learning) and building the nation (i.e. women need take IT as a strategy to live in a world dominated by men, women use IT to get their spouses-online dating).* Others, such as Adem offered more liberating definitions. “*In recent times women have ventured into traditionally male dominated industries as a way of empowering themselves. I think that they are participating in IT for the same reason [as men].*” Chata furthered this point.

*Most women participate in this program to fill the vacuum created by the domination of male counterparts in the field of IT. They have realized that they too are capable and given the same conditions to operate in. Women have also endeavored to participate in this program so as to be informed of the various technological changes since women form the major part of the social fabric they have to be well informed so as to foster development.*

## **DISCUSSION**

Our study examined the perspectives of Kenyan women and men on the digital divide along with the participation in the IT workforce. Through interviews with 32 female and 31 males students enrolled in Strathmore University in Kenya, we have attempted to include male perspectives which are generally untapped in the IT gender literature. Our findings largely reiterate the gendered perspectives found in similar studies conducted in other countries, but they also provide insights into the localized causes into what appear as global perspectives.

Both cohorts were highly optimistic, embracing IT as a practical mechanism for achieving entry into the male dominated, technology workforce. Both groups advocated for IT skills and competencies to facilitate economic development and a myriad of other benefits often coupled with IT. IT access and training was seen as imperative for their individual career success as well as the development of the entire nation. Female IT workers were seen as playing an integral role in such development. Both groups expressed nation transformation via technology-based services and products, and employers with greater business and technical expertise. Moreover, both women and men articulated the need for improved public policies to facilitate infrastructure and workforce development.

However, women expressed some unique standpoints. For instance, they desired cultural change that provided them with educational and employment equal to that of men. "To the degree that the male breadwinner role is pushed more and more into the background, women are forced to earn their livings in a combination of the private and the public spheres." (Hossfeld, 2005, p 5). However, while women felt compelled to work outside of the home, they went perceived barriers which negatively affect their entry in the IT workplace. One particularly salient barrier was the perceived unwillingness of employers to hire inexperienced workers – given the perception of IT being a male dominated sector. Women noted the opportunities afforded by entrepreneurship. Historically, women in the sub-Saharan Africa region have engaged in entrepreneurial endeavours. We suspect that entrepreneurship provided both a mechanism for avoiding the perceived gender biases held by hiring managers as well as a reasonable avenue for paid employment.

While the women and men in our study showed very positive attitudes towards gaining an IT education, despite expressed challenges, more research is needed in this area. Given that we concentrated our study on an urban IT-based university, findings cannot be generalized to the experience with women in the rural parts of Kenya which constitutes over 70% of the country's population. Our study, like most studies that portray a positive view in terms of growth of information technology in sub-Saharan Africa, tells the story of the urban African "elites." Again, we contend that future studies should concentrate on rural, "forgotten" parts of Kenya and other developing nations. The discourse of location (urban versus rural; or mainstream versus displaced) is not unique to Kenya. The US and other Western nations have their share of adversity associated with location, displacement, and socioeconomic disadvantaged groups. The digital divide discourse will not only extend the debate on the disenfranchisement of certain groups from access to information technologies, but also disenfranchisement of given regions, such as these rural areas, hence presenting a more viable platform for sustainable IT growth.

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