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Bridging the digital divide among low income urban communities. Leveraging use of Community Technology Centers

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ABSTRACT

To fully leverage the availability of the internet services in Kenya, all the citizens need to be able to access and use the internet and related services. The availability of 4G networks, cyber cafés and fiber connectivity in most residential areas of Nairobi has allowed many Nairobi residents to be part of its information-based society. But, as with the other existing social inequalities in Nairobi, many people residing in the city's low-income areas lack access to the internet. This has a negative impact on the residents' prospects as the governments and businesses are increasingly delivering their services online. Using a pre-tested questionnaire, data were collected from five hundred and fifty respondents on their internet access and digital literacy skills among the residents of the Mathare Slum. From the survey, the study found existence of limited digital literacy skills and lack of internet access among the residents of the Mathare Slum. The study then used the Community Technology Centers (CTCs) intervention approach to narrowing the digital divide by setting up a CTC in the Mathare Slum to offer free community internet access and digital literacy skills training. Eight cohorts, each of eighteen residents, were offered free digital literacy training for five weeks and free unlimited internet access for four months. The study then evaluated the trainees' internet usage continuance intentions after four months of continued use of the internet at the CTC. The results indicate that perceived enjoyment, perceived usefulness, internet self-efficacy, and confirmation of expectations all significantly influence the participants' satisfaction with use of the internet. The results also show that continuance intentions of the participants from low income household to continue using internet beyond the CTC can be predicted by perceived service cost, satisfaction, internet self-efficacy and perceived usefulness. The study demonstrates the effectiveness of CTCs as an intervention approach and a replicable model that can be used to bridge the urban digital divide among low income urban communities for the development of an all-inclusive information-based society. Implications and recommendations for policy, practice and research are provided.

1. Introduction

Over the last few years, Kenya has witnessed a phenomenal growth in the use of mobile internet services as affordable mobile internet technologies have been made available for home and office users (Wamuyu, 2015). Actually, Kenya could be regarded as a mobile nation as it is the home to the world's largest mobile money platform, M-Pesa. It has occasionally been referred to as the "Silicon Savannah". Statistics from Communications Authority of Kenya (CAK) indicate that Kenya had 37.4 million Mobile data/internet subscriptions by March 2016 (CAK, 2016). The availability of cyber café in residential areas and low cost fiber connectivity

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to the homes have also resulted to increased use of internet services. For Kenya as a country to fully leverage the availability of the internet services, all her citizens need to be able to access and use the internet and related services. The availability of mobile networks, cyber cafés and fiber connectivity in most residential areas of Nairobi has allowed many Nairobi residents to access internet from the comfort of their homes. Most of the Nairobi residents have become part of Nairobi's information-based society, creating a huge demand for knowledge workers and knowledge-intensive services.

Due to the existence of conspicuous social inequalities in Nairobi, and with the absence of any research on urban digital divide in Kenya, this study started as an open-ended exploration of the existence of digital divide among different residential areas in Nairobi County. The Organization for Economic Co-operation and Development (OECD, 2001) defines digital divide as "the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access information and communication technologies and to their use of the internet for a wide variety of activities" (p. 5). Campbell (2001) defines digital divide as "situations in which there is a marked gap in access to or use of ICT devices" (p. 8), and concludes that there is clear evidence that such a divide exists between and within countries. Ono and Zavodny (2007) indicate that digital divide can occur between genders, ages, education groups, income groups, racial, and ethnic groups. Rao (2005) suggests that digital divide could be explained by the differences in "access to information, the internet and other information technologies; in skills, knowledge and ability to use information and other technologies based on race, gender, geography, economic status and physical ability" (p. 3).

Being on the wrong side of the digital divide can be devastating for any individual and efforts must be made to achieve digital inclusion for all. Studies have shown that regular computer use is positively correlated with self-esteem, motivation (Reaux et al., 1998), and problem solving (Mayer et al., 1999). The success of youths from low income communities, such as Mathare Slum, in the labor market is also attributed to their ability to use, adapt, and transfer technology and knowledge-based skills (Harris, 2005). Governments (at county and national level) and companies are also increasingly delivering their services online.

To explore how internet and related technologies could become part of the residents of Nairobi's low income areas everyday life and to reduce the existing digital divide, the study chose to use a CTC as a community-based intervention strategy. Dutta-Bergman (2005) suggests that if a digital and persistent technological divide exists, the interventions like CTCs are meant to provide a shared place for community members to cross that technology divide. Servon and Nelson (2001) defines CTC as "community-based efforts to provide computer access and training to disadvantaged populations that would otherwise not have such access" (p. 2). A CTC was started at the Mathare Community Resource Center. The CTC was to provide digital literacy skills training, offer free internet access services and to develop a community digital repository. Rao (2005) recommends that any endeavor to reduce digital divide should take care of access, knowledge and content. The study was guided by the following questions:

1. What is the extent of digital literacy and internet access among the Mathare Slum residents?
2. To what extent would CTC beneficiaries adopt computers and internet?
3. What factors are critical for continued internet usage by the CTC beneficiaries beyond the CTC project?
4. Could CTCs be used to successfully bridge the urban digital divide among low income urban communities such as the Mathare Slum?

This paper makes a practical contribution in that, while there have been many studies on the use of internet in Kenya and on the existing global digital divide, research on how the CTCs can be used to bridge digital divide among the marginalized communities in Kenya has not been done. Also, studies on urban digital divide in Kenya have not been done. The next section describes the study's methods. Section 3 gives the study results and discusses the study findings while section 4 reflects on the success of the study, its conclusion and directions for further studies.

2. Materials and methods

To explore the extent of urban digital divide among the households in Mathare Slum in terms of digital infrastructure, digital literacy, and internet access, a quantitative study was done using multiple distinct surveys in two phases. The first phase was to serve as the baseline study. The second phase was to test the CTC's users' intention to continue using the internet beyond the CTC study project.

For the purpose of the study, a household as a whole was the focus of the initial analysis. Scott (1997) defines a household as "a group of people living together under the same roof and sharing basic accommodation facilities" (p. 593). The respondents from Mathare Slum were approached and informed about the purpose of the survey in advance before they were given the questionnaires. A total of four hundred and seventy-five (475) questionnaires were properly filled out by the respondents, yielding a 95% response rate.

The baseline data results showed limited digital literacy skills and lack of internet access among many households as indicated in Table 1. As indicated in Table 1, only 8% of the households had at least one member accessing internet while only 4% of the households had one member having digital literacy skills. To measure the household use of computers and internet, use of cyber café services was included as accessing internet and computers in cyber cafés is probably still more economical than acquiring domestic facilities for the low-income households. Internet access at cyber cafés is also a way of sharing the cost of using ICT resources amongst several users, hence lowering the cost of internet access (Wamuyu, 2015).

A CTC was setup at the Mathare Community Resource Center for five months and later moved to a different venue at the Caso Upendo Primary School within the Mathare Slum. From the baseline questionnaire respondents, eight cohorts of eighteen residents each were selected to attend the five week, two hours a day digital literacy training and unlimited access to free internet at the CTC