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An assessment of the role of agency among semi-skilled workers: Challenges in the attainment of developmental outcomes from the use of ICT

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Abstract

There has been a widespread consensus for some time that Information and Communication Technology (ICT) can play an important role in the lives of individuals in poor and under resourced contexts as it enables them to engage in economic and social activities through access to information. The Covid-19 global pandemic has highlighted the need to re-intensify efforts to ensure participation in the digital era to all people regardless of social and economic status. As such, there are increasing programmatic interventions to provide ICT and internet access to individuals in communities. However, evidence to date indicates that there is a low uptake among older and working-class individuals. As such there are several aspects of the underlying digital inequality in society that must be understood. In light of this, this paper draws on the Choice Framework to investigate individuals' agency in navigating the ICT-opportunities that could lead to developmental outcomes. The findings show that there is a deficiency in the resource-set of semi-skilled workers which in turn make it difficult to navigate relevant structures in society to achieve both social and economic outcomes in their lives. Moreover, even though some semi-skilled workers have free access to the internet at their workplace or at government funded community centres, they are unable to make effective use of the internet. Consequently, they are denied potential developmental outcomes that they otherwise could have realized.

Keywords: ICT, Choice Framework, agency, choice, developmental outcomes, digital divide, effective use, ICT4D

1. Introduction

Since the turn of the century and the first World Summit on the Information Society (WSIS) Governments and various stakeholders have given serious attention to the role of Information and Communication Technology (ICT) in addressing societal and economic ills. ICT which in its simplest form, refers to technologies that are used to receive information and aid communication (Ponge, 2016) and has held the promise to enable poverty alleviation (Kauffman & Riggins, 2012). There is widespread consensus that access to ICT can benefit those who use it well with a better quality of life, increased income, and cultural and political advantages (Bridges.org, 2005; Pather, 2012). On the contrary, those who do not adopt and use it are left behind and as a result, the ICT gap or digital divide prevails. The persistence of the digital divide has exacerbated the gross inequalities that face the average poor person.

Selwyn (2003) argues that the ability to use ICT is a necessity to living and working in the information society. Having access to ICT will improve people's lives and enable them to become *effective users* of technology. Effective use is defined as the opportunity to successfully use ICT to attain self-identified goals (Gurstein, 2003). To make effective use of the

opportunities in communities, citizens are required to be ICT literate, skilled, and have access to a functional and connected device (Attwood, Diga, Braathen & May, 2013). Therefore, access to, and consequent *effective use* of devices and networks are critical to attain *developmental outcomes* such as reduction of poverty, increased social inclusion and the creation of a better life for an individual. It is commonly agreed that ICT does have a pivotal role to play in human development by improving the lives of people, since access and adoption opens the door to knowledge, financial and employment opportunities for many people worldwide (ITU, 2019).

However, a significant digital divide exists (ITU, 2017), which is threatening to become the new face of inequality, reinforcing the social and economic disadvantages suffered by women and girls, people with disabilities and minorities of all kinds (United Nations, 2020). At the end of 2018, only 80.9% of the world's population, in developed countries, were using the Internet and only 45.3% in developing countries (ITU, 2019). Some people are more privileged to have access to and use technology while others do not have and have more restricted access (Cohron, 2015). As a result, many countries seek to create a society where all citizens can reach and share information by forming policies to narrow the digital divide.

Recently, the global Covid-19 pandemic has heightened the call to eradicate the digital divide. The global crisis, including multiple lockdowns of communities, has heightened the digital inequality in that those afflicted by the digital divide were not able to engage in education activities, undertake online shopping or even access the latest news on the state of the pandemic, as well as a plethora of survivalist activities. In South Africa, like many other countries the provision of access to ICT through public access centres (PACs) has been widely commended as one of the initiatives to enable communities to participate in today's information led economy (Lebele, 2016). However, there is evidence that even though public access interventions may exist, they do not in itself diminish the digital divide. There is evidence of challenges that face the average citizen in respect of ICT access and adoption, e.g. Mapeshoane and Pather (2016) and through our observations in ongoing research efforts in poor Cape Town communities. While the plight of the unemployed person is well understood, we have also observed that even those who are in employ are in the digital divide. In light of the foregoing, this paper seeks to investigate the underlying problems that might be faced by semi-skilled employed workers in poor communities in respect of adopting and using the internet.

2. Context and Motivation

Even as technology becomes more affordable and internet access seem to increase globally, a digital divide between developed and developing countries and the rich and poor still remains (Ayanso, Cho & Lertwachara, 2010). The government's most acclaimed strategies were to provide the public with access to technology and the internet through PACs (Davison, Vogel, Harris & Jones, 2000; Uys & Pather, 2016)). In the following sections the context of the problem identified is expanded through an overview of the digital divide, the initiatives to address the digital divide as well as the challenges in relation to ICT adoption.

2.1   From digital divide to digital inequality

The notion of digital divide is not a new phenomenon, as the concept was initially coined during the mid-1990s (Connolly, Lee & Tan, 2017). Digital divide is a wide-ranging concept and it usually exists between those living in cities and in rural areas (Várallyai, Herdon & Botos, 2015). As such the Digital divide normally refers to the gaps in access to and use of technology across households (in urban and rural areas) and on socio-economic differences across households (Connolly, Lee & Tan, 2017).

With the advent of broadband internet, the divide has become more pronounced. Over recent years the divide is far more than the geographical divide that prevails between urban and rural. The digital divide now also mirrors the prevailing socio-economic inequalities that perpetuate across society. According to Kleine (2010) the digital divide also occurs due to the lack the availability, affordability and skills required to use ICT. This notion of the divide is reflected in the South African White paper on ICTs which sets forth the principles that guide the achievement of universal access to ICTs, including:

- "Availability of networks and coverage;
- Affordability including the ability to pay for access to infrastructure, networks, devices and services;
- Accessibility and the ability of all people to use and access services regardless of education, disability, age, gender etc.
- Awareness by users and potential users of what is available and the benefits of these;
- Ability of different groups of people and individuals to not only access services and acquire information and data but also to use the information and data to enhance the quality of their lives (i.e. digital literacy)."

(South Africa, 2016: 32).

Based purely on access indicators, the South African digital divide remains prevalent, especially with regards to access to the internet. In the South African context, only 64,7% of households had at least one member who had access to the internet, or used the Internet either at home, work, Internet cafés or educational facilities and an astoundingly low 10,4% of households had access to the internet at home (Statistics SA, 2018). In light of this the government has made, and continues to make, extensive efforts towards addressing the digital divide such as through public access centres (PACs). Having access to PACs empowers people, of which there are many individuals who has not been exposed or able to gain the benefits of these centres (Castells, Gelernter, Vazquez & Morozov, 2014:14) However even in urban areas there are individuals who might be in proximity to government facilitated free internet access, but who not adopting and making effective use of such access. Studies have found that the role of motivational determinants and material determinants (Scheerder, 2017), are also factors in relation to the divide.

This points to the underlying complexity of the situation. As such the prevailing inequalities must be investigated further in order to understand what other factors, beyond that of access are associated with the perpetuation of the digital divide.

2.2   Challenges in relation to ICT adoption

Adoption of ICT refers to the use of computers and the Internet. Straub (2009:626) avers that ICT adoption involves an individual to make a choice to either accept or reject a specific innovation. The choice an individual makes to adopt and use ICT, has an impact on their everyday lives (Barron, Kemker, Harmes & Kalaydijian, 2003). Therefore, an individual needs to understand and know the consequences of choosing to (or not to choose) adopt and be aware of the factors within the social context in order to adopt (Straub, 2009:625). For several decades, the South African government has dedicated itself to achieve universal access to ICT, especially in underserved communities (Parkinson, 2005). However a challenge is that individuals in communities remain unaware of the benefits that ICT can bring to them (Uys & Pather, 2016). Another challenge is that of affordability, and the hashtag #DataMustFall is a well-known slogan in South Africa that has been used in protest against the high price of access

to the broadband network. Notwithstanding, even where free access prevails, there is evidence that especially older persons in poor communities struggle to make effective use of the internet.

2.3   Objective of the paper

The main aim of this study is to investigate the role of an agency among semi-skilled workers in navigating the opportunities that are presented by ICTs and access to the internet to make choices that could lead to ICT-facilitated developmental outcomes. The next section outlines methods used to collect and analyse data. Thereafter the paper presents the results.

3.   Research Methodology

3.1   Theoretical Framework

The underlying policy goal of ICT public access programs is to catalyse economic and social development among citizens. The South African ICT White Paper sets out its purpose as to ensure that "everyone in South Africa, regardless of who they are, where they live or their socio-economic status can improve the quality of their lives through accessing the benefits of participating in the digital society" (South Africa, 2016:1). As such , the point of departure for this study was to assess why individuals who had access to the internet were not adopting or making effective use of the internet, given that all persons, regardless of status, does seek social and economic improvement. In this regard, the Choice Framework (Kleine, 2010), was deemed appropriate given that it serves to systematically analyze the underlying problems that might be faced by individuals in poor communities in respect of adopting and using the internet (Figure 1). In addition, the Choice Framework was also used in other studies e.g. Horn and Rennie (2018) which also set out to investigate why users do not participate equally in online practices. Kleine (2010) explains that the primary development outcome for an individual is that of choice, a development concept which she draws on from Amartya Sen (Sen, 1999). The primary argument is that *choice* is both the aim and the means of development.
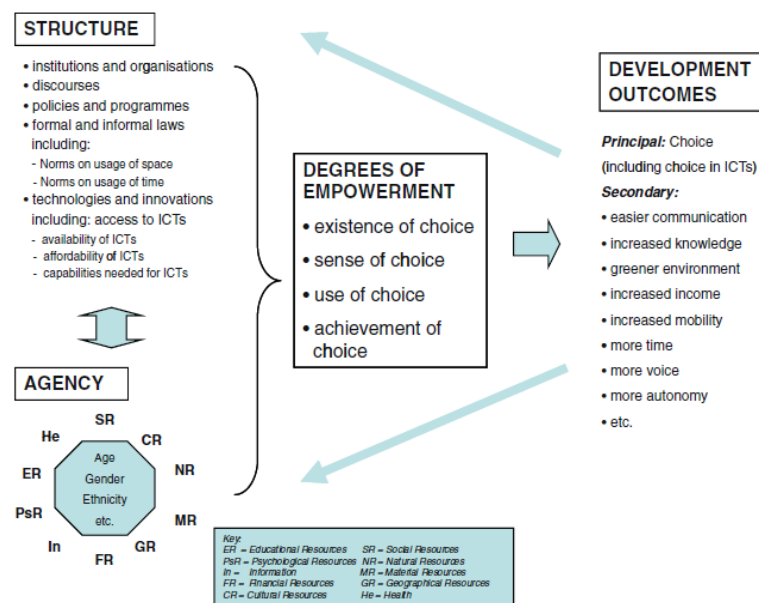

Figure 1: The Choice Framework
(Source: Kleine, 2010)

Primary developmental outcomes refer to the choice itself. In the case of this study choice refers to a choice which individuals make to adopt and use the internet to achieve secondary developmental outcomes. Secondary developmental outcomes, according to the choice framework refer to what individuals' value in life, including, for example, easier communication, increased knowledge, job creation and more autonomy (Kleine, 2010). Developmental outcomes are all about the kind of life people choose to live. *Agency* refers to an individual's resource portfolio and includes ten tangible resources such as educational, psychological, information, financial, cultural, social, natural, material, geographical resources and health (Kleine, 2010). The *structure* component of the choice framework includes rules, laws, formal and informal norms and policies which an individual navigates through their *agency* (Kleine, 2010). The *degrees of empowerment* are dependent on the individual's agency and the structures within which they operate. Agency, together with structure help the individual's agency to determine how resources can be adapted into capacities (Kleine, 2010).

3.2   Methods

The study explored the experiences and perceptions of working-class individuals who have access to the internet, but who are not making effective use of it. The effective use of the respondents was not measured, hence we asked them before the interview if they were frequent users of the internet or not. The interview schedule was designed to extract elements of the Choice Framework to gain a broader perception of how individuals make a choice to use the internet and if they have resources available to them to navigate the applicable structures in society to attain developmental outcomes.

We engaged in purposive and snowball sampling to identify the appropriate unit of analysis (UoA) to collect the data. As per the primary research aim, our sampling objective was to identify twenty-five semi-skilled employees at an organization located in Bellville within the Cape Metro in the Western Cape Province of South Africa. After initial negotiations with the organisation, we identified security guards and cleaners as worker categories that were aligned to the UoA. Snowball sampling was used as initially we found a reluctance among our UoA to be interviewed. However, upon knowing that they were recommended by a fellow colleague, they were more amenable to grant an interview.

The researchers undertook the fieldwork between September and October 2019 to perform the interviews. The interviews were recorded with an audio recorder. During the interviews, records of observation and field notes were used as part of the data collection strategy. Using the Choice Framework as a lens, the data was coded and categorised until several high-level themes emerged. This study used thematic analysis as the main analytical strategy and the process involved identifying themes within qualitative data (Maguire & Delahunt, 2017:3352). ATLAS.ti, a tool for qualitative data analysis, was used to support the researchers during the data analysis process for coding of transcripts and associated textual analysis (Smit, 2002:65).

Details of the demographics of the respondents are displayed in Table 1. The majority of the respondents consisted of security guards, whose highest level of education was less than a high school certificate.

4.   Results

The findings demonstrate how respondent's agency is used (or not used) to navigate structures around them to use the internet and associated devices. As a starting point, we acknowledge that the reasons for people to make use of the internet is a combination of socio-economic, motivational and psychological factors that have an impact on whether people use the internet

or not (Helsper & Reisdorf, 2013). The reasons for not using the internet are manifold amongst users. Those who do not use the internet are offline because of choice, interest and disposition, or other issues such as access and skills (Groselj, Reisdorf & Petrovcic (2019: 214). In addition, respondents identified the following resources as predominant in terms of their restrictions to attain developmental outcomes: material, educational, psychological and geographical resources; and other factors.

		Frequency	Percentage
Monthly income	Below R5000 ($341.37)	2	8%
	R5000 - R10 000 ($341.37 - $682.73)	21	84%
	R11 000 - R15 000 ($751.10 - $1024.23)	1	4%
	R16 000 - R20 000 ($1107.73 - $1365.46)	1	4%
	Total	**25**	**100%**
Occupation	Security guards	21	84%
	Cleaners	4	16%
	Total	**25**	**100%**
Highest level of education	Less than Grade 12	15	60%
	Grade 12	7	28%
	Diploma	2	8%
	Advanced Diploma	1	4%
	Total	**25**	**100%**

Table 1: Demographics of respondents

4.1 Material Resources

Material resources are defined as items owned such as machinery, computer hardware and other equipment to access the internet (Kleine, 2011). In this study, 80% of the respondents own a mobile device that is capable of connecting to the internet. It is evident that they do not make use of other devices, such as computers or laptops, which are one of the biggest problems these respondents face. One of the respondents said that: *"I use my sister's device. I then use her data. She would come from work and I just want to see some pictures. I do my own thing and download. I just want to check something for example google a celebrity. But she complains and yells because I use her data".* As a result, this is a cause of their lack of knowledge, lack of motivation and support, lack of ICT skills and lack of awareness and understanding of ICT. One of the respondents said that: *"I only use mobile phone, I don't have a laptop, and not here at work, because I can't use a computer here at work".* This supports the data that indicates that the respondents are not allowed to use computers at their workplace, as it is not part of their work function. Due to the lack of material resources, it is evident that there is a gap in the ownership of associated devices which inevitably results in lack of ICT skills and knowledge, and confidence to access and use the internet.

4.2 Educational Resources

Educational resources refer to having the skills to use both devices and the internet itself. It is evident that respondents have access to free Wi-Fi at their workplace. However, they are unable to use the internet to attain developmental outcomes due to a lack of ICT skills and knowledge. It was found that 60% of the respondents lack higher education, and whose level of education was below that of a high school certificate (referred to as a Matric Certificate in South Africa).

Low levels of education and lack of ICT skills are barriers which influence the adoption and use of the internet. The lack of knowledge and ICT skills in this regard also led some respondents to abandon other software applications and platforms, because they do not know how to use the application properly. When they were asked: *"Do you have an idea of what the Internet is?"*, most of them could not give an explanation without the researcher trying to probe additional questions for more clarity. One of the respondents' answer was: *"No, I don't, just know what it used for but don't know what it is"*. This is supported by Peng, Kanthawala, Yuan & Hussain (2016) who suggest that the lack of ICT skills is one of the educational barriers resulting from users not knowing how to use applications. Therefore, educational resources impacted the perceived ease of use negatively.

4.3 Psychological Resources

Psychological resources include self-confidence, tenacity, optimism, creativity and resilience (Alsop & Heinsohn, 2005). Several respondents encountered, in general, a lack of confidence. One of the respondents said that: *"I am scared when it comes to banking information or scared clicking the wrong button"*. Technology anxiety is described as a person's apprehension when challenged with the likelihood of using a computer or the internet. Byers et al. (2016) mention that fear can also be a barrier. The lack of confidence and technology anxiety is caused by a lack of ICT skills and knowledge. It was found that most of the respondents in this study, at the surface, appeared to exhibit confidence to use the internet, should they need to undertake a simple task for general information search. For example, several respondents described how they simply just type anything into a search engine and that they are able to obtain information. However, this notwithstanding, what the data does demonstrate is that there is an innate lack of confidence to use the internet for more clearly defined social or economic related gains.

4.4 Geographical Resources

Geographical resources concern the practical implications of location and relative distances to access ICTs. Cybercafés plays an important role as the starting point for first-time users in order to build their confidence and skills with computer literacy (Gomez, Pather & Dosono, 2012:14). In the case of this study, although respondents are making use of the free Wi-Fi when they are at work, both PACs and Cybercafés are not in close proximity to their homes. So, despite their autonomy of use (Hargittai, Piper & Morris, 2019), which refers to the freedom to use the internet when and where one wants, they do indeed face restrictions to internet access when they are at home. Therefore the notion of autonomy is compromised. For example, one of the respondents explained that: *"In Manenburg[1] there are no internet café's nearby, you must travel to Bellville for one due to the area and crime"*. Another respondent lamented the distance and said that: *"Distance to these accessions* [sic]*, you have to use transport"*. The physical proximity to PACs and Cybercafés is associated with the crime and safety in the area and is in agreement to the findings of Gomez & Pather (2012) and Uys & Pather (2016) that the location of PACs is seen as one of the barriers to access the Internet, thus their autonomy of use is restricted. Therefore, geography related constraints are a challenge to respondents.

4.5 Affordability and the constraint of time

Another factor that was identified which prevent individuals to attain developmental outcomes is affordability, low level of income, and time constraints. Affordability was a key issue for those who are not yet connected to the internet, either by mobile phone or computer, due to their low level of income. 84% of the respondents earn an income between 341.37 USD and 682.73 USD per month (5000 – R10 000 ZAR). With this low level of income, respondents

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[1] Manenburg and Belville are communities in the Cape Town metropole

reported that the average cost of data was beyond their reach. Despite many efforts to reduce price, affordability remains a significant constraint for many people not using the internet.

Time was also a hindrance. Respondents work a 12-hour shift and are only allowed to use the Wi-Fi at work during their lunch or when it is quiet at night. If they were able to use PACs in their community, they find that their shift work makes it prohibitive. One of the respondents pointed out: *"I don't have more time because I'm always here at work, don't have time to go to Internet Café"*. The findings are supported by Groselj, Reisdorf & Petrovcic (2019:215) who identified four dimensions that are critical for users to access and use the internet: attitudes and interest; access; cost and absence of digital skills.

4.6 The interaction between agency and structure to reach degrees of empowerment
The interaction between agency and structure to achieve developmental outcomes are explained by the Choice Framework (Figure 1). In this study context, the organization that served as the site of study, does avail adequate resources in the form of free Wi-Fi. As such all respondents, are presented with an *existence of choice*, and even a *sense of choice*. However, at this point their ability to move to the next degree of empowerment, viz. *use of choice* is a challenge, due to deficiencies in the agency. Therefore, respondents are not able to transcend from being aware of the existence of choice, to ultimately realizing choice. At the same time respondents did sense certain developmental outcomes that they aspired to and which they value in life. These included personal growth, better job opportunities and becoming more adept at technology use.

For the achievement of developmental outcomes, a choice must exist (the availability of the Internet), the sense of choice (considering the Internet is something one can access and use), the use of choice (one choose to act), and the achievement of choice (one was able to make the choice he or she had reason to value). The existence of choice refers to whether an opportunity to make a choice exists (Alsop & Heinsohn, 2005). The use of choice involves evaluating whether or not a person takes advantage of an opportunity to choose (Alsop & Heinsohn, 2005). It is evident that the respondents make a choice to use the free Wi-Fi. The achievement of choice is evaluating how far a person is able to achieve their desired outcome. One of the participants responded: *"Sometimes I use my daughter's laptop, but she shows me stuff"*. This indicates that he has a sense of choice, but has to rely on someone else to assist him to achieve the choice. Therefore, an individual's choice can be explored by analyzing the association between their agency and structure.

5. Conclusion
This paper reports on research that was conducted to better understand the nature of the digital divide, and the low uptake among working adults from poor communities, in light of the recent global pandemic. Although the data was not collected during the pandemic, it highlighted the importance of ensuring to narrow the digital divide. The research investigated the underlying problems that might be faced by individuals in poor communities in respect of adopting and using the internet. The underlying theoretical framework was the Choice Framework which provided a conceptual lens to investigate the effect of an individual's agency in navigating the opportunities that are presented by ICTs and access to the internet to make choices that could lead to ICT-facilitated developmental outcomes. The empirical data was used to understand the resources that comprise the *agency* of semi-skilled workers and the factors preventing individuals to not realise the benefits presented by the Internet. From the analyses, the paper draws conclusions regarding the agency of semi-skilled workers in terms of the resource constraints that prevent individuals from navigating the ICT related structures.

The findings show that there is a deficiency in the resources of semi-skilled workers. As a result, material, educational, psychological and geographical resources, and other factors are preventing this demographic to attain developmental outcomes. The main deficiency in agency relates to the following: the lack of ICT skills and knowledge, lack of awareness and understanding of ICT, and low level of education and income. Furthermore, barriers such as not owning a device and time constraints are a deficiency in terms of resources. However, while these appear to be prevalent, they can be overcome. The findings further note, that long working hours makes it difficult for this group of internet users to navigate the relevant structures to access ICTs and free internet access.

A firm recommendation that emanates from the findings is for more active digital skills training in the form of workshops and short courses are critical in enhancing computer usage and use of the internet. In this study, all of the participants indicated that they would attend workshops and short courses to help them gain more knowledge and skills on how to use the internet and computers. There is a need as such for both employers and government to make computer literacy training available to this demographic as it will increase awareness and effective use of ICT. To date much attention has been on the youth. Consequently the middle-age demographic especially from the working class remains on the wrong side of the digital divide as they are unable to navigate the appropriate structures to realize benefits from the internet. Therefore, it is extremely important that this be taken into consideration if ICT policy objectives in respect of attaining social and economic developmental outcomes are to be fulfilled for the entire population. The design of such programmes must take into account the diverse characteristics of the target population, from both a design and implementation considerations. Future studies should look into modalities of providing such training.

Additionally, the findings of the study found that even though semi-skilled workers have free access to the internet at the workplace, but due to the deficiencies in their agency they are unable to make effective use of the Internet, thereby denying themselves of the potential development outcomes that they could potentially realise. This is the question probed by this research, and as such we conclude that the lack of agency has hindered the achievement of choice, and therefore the attainment of social and development outcomes amongst the respondents.

Finally, the paper contributes to the ICT4D field in two ways. Firstly the study adds to the existing body of evidence in respect of the application of the Choice Framework as a lens that is suitable to analyse to the underlying problems that are faced by individuals in relation to ICT adoption and the consequent effective use that must follow to achieve development outcomes. Secondly the paper advances our thinking in respect of ICT4D related public policy. This paper confirms that supply side interventions such as free access to the internet is not sufficient to achieve development. The findings lend support to the need for integrated interventions in which affordability, awareness and skills are also critical factors to enhance the agency of individuals thereby enabling the conversion of choice to use ICTs into much needed social and economic outcomes.

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