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ICT AND EMPOWERMENT TO PARTICIPATE: A CAPABILITY APPROACH

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ABSTRACT

Under which conditions can ICT4D initiatives empower poor communities of developing countries? In this paper we evaluate the promise of development associated with the introduction of an ICT initiative in Nigeria. We employ the basic concepts of the Sen's capability approach to understand how the introduction of prepaid electricity billing system has empowered people to participate in accessing electricity supply. Our analysis illustrates that various activities resulting from the introduction of the system allow for the participation of both consumers and electricity workers, and in order for them to be empowered to participate in each of the activities, different resources are required. We conclude with some implications for policy makers advancing an agenda for 'ICTs for Development'.

Keywords

ICT, Empowerment, Participation, Capability Approach, Developing Countries, Nigeria

INTRODUCTION

In recent years, there have been vast investments on Information and Communication Technology for Development (ICT4D) initiatives in developing countries to empower poor communities. In so doing, emphasis has been placed on providing access to ICTs to improve the living conditions of the poor by allowing them to participate in the political and economic system of the society (Gigler, 2004). Based on this approach, ICTs can enhance the poor directly with tools for self-empowerment and participation (ITU, 2005; Maier & Nair-Reichert, 2007). However, Warschauer (2003) noted that empowering the poor cannot be promoted solely by providing access to ICT; rather, a range of factors must be involved such as digital, physical and human resources. Further work has also challenged the technologically deterministic approaches. This perspective highlights that there is not yet a direct link between investments in ICT4D and the empowerment of the poor (Avgerou, 2003) but suggests that there is a dynamic relationship between an information system and the social context that sustains it (Walsham, 2010; Avgerou, 2003). This has led Walsham et al. (2007) to call for more emphasis in examining the social and contextual aspects of ICT4D.

Building on this line of research, this paper suggests a wider theoretical lens to help foreground the complexity and multiplicity of ICT4D initiatives in developing countries. Furthermore, ICT4D literature tends to focus mainly on design, transfer and implementation issues (Bhatnagar & Singh, 2010) and little concrete analysis on the development aspect of these ICT4D initiatives (Madon, 2004). Hence, we draw upon Sen (1999)'s capability approach (CA) to provide a theoretical lens with which to conceptualise empowerment and participation in the discourse of ICT4D. The CA allows the study of ICT4D by moving beyond the space that focuses on economic growth, to consider and operate in the space that concentrates on the effective opportunities people have to achieve what they consider to be valuable in life. If it is claimed that an ICT initiative empowers people, the first question we ask is empowerment to do what?

Using the CA, we analyse how the introduction of an ICT initiative has empowered people to participate in developmental activities. A case study of the introduction of the pre-paid electricity billing system in Nigeria is used to illustrate this perspective. The contribution of this paper is to apply the concept of the CA in information systems by providing a theoretical lens to address the multiplicity and complexity of empowerment and participation in the discourse of ICT4D. The rest of the paper is organized as follows. The next section reviews the relevant literature on the notions of empowerment and participation, focusing on the concept of capabilities as the key concern of our study. This is followed by a section providing details of CA and some selected key concepts upon which the authors will draw to understand how the introduction of the prepaid billing system has empowered Nigerian citizens to participate in development activities. The research method, research setting and the analysis of the case are then presented. The final section concludes the paper and demonstrates implications for research and practice.

LITERATURE REVIEW

Empowerment

The term 'Empowerment' is a contested notion. It is a very complex term that is difficult to define. According to Gigler (2004), the main reason for the current lack of clarity concerning the definition of empowerment is on the different interpretations of power and the contrasting views on the centrality of power for the development process. Furthermore, its definition depends on the context and overtime (Wheeler, 2007). Somerville (1999) refers to empowerment as any process where people can gain increased control (individual or collective) over their lives. Narayan (2005, p.3) further defines empowerment as any process that enables "self-confidence, self-direction, autonomy, and self worth". However, Cornish (2006) noted that viewing empowerment abstractly, as a state which can be occupied, or something that can be increased tends to hide rather than recognise the multiple and contradictory nature of the powers and disempowerment which people experience or enact. For the purpose of this paper, empowerment is the process of gaining a concrete, new *power to perform some specific action* (Cornish, 2006).

Here empowerment is not seen as an increase in self-confidence or control, rather the ability to take an action. Empowerment is not something to measure but something to be qualitatively specified in terms of a concrete domain of action. Based on this line of argument, Kabeer (1999) emphasizes on option, choice and control as the basic components of empowerment. She argues that empowerment is "*the expansion in people's ability to make strategic life choices in a context where this ability was previously denied to them*" (Kabeer, 1999, pg 473). This view of empowerment entails enabling people to develop their full range of human capabilities (Gigler, 2004). It resonates with Amartya Sen's (1999) capability approach that views development as the process of expanding the real freedoms that people enjoy to lead the lives they have reason to value. The focus of this perspective is building capabilities (Prakash & De, 2007) and creating societies where the potentials of

individuals can be realised (Sein & Harindranath, 2004). Sen (1999, pg 18) also emphasises on the empowerment of the poor by stating “*greater freedom enhances the ability of people to help themselves and to influence the world, and these matters are central to the process of development*”.

Another term strongly associated with empowerment is participation. The notion of participation is as problematic as the notion of empowerment (Lyons et al., 2007; Rissel, 1994). Participation is used to refer to the different forms of involvement by an individual or groups in organised activities. This may be in the form of electing a leader of a country, or accessing public services such as electricity. It can mean training members of the community to be agents of a peace intervention, or it can mean forming a forum where members can discuss their plans and goals. The existence of such different interpretations of empowerment has caused a degree of confusion as to what participation means amongst policy makers, development workers, local people and social scientists. The absence of a precise meaning of the term “participation” has risked it becoming no more than jargon which can be used freely to legitimise any or all community development projects (Kelly & Vlaenderen, 1995). However, given the contested nature of the concept, it is important to clarify the meaning of participation. For the purpose of this paper, participation is “*a social practice relating community members to an organised change process*” (Cornish, 2006, pg. 305). The social practice could take various forms such as accessing a service, taking part in a discussion forum and so on. The change process is a concept of empowerment whereby certain resources are required in supporting the empowerment of the poor (Gigler, 2004).

Apart from its meaning, there has also been a debate about the role of participation in development discourse. The debate has centred on whether participation is a means to development or an end in itself. According to Oakley et al. (1991), participation is a means of achieving development. However Abbot (1996) noted that when participation is used as a means to development, its role is largely as a political tool, and it involves a significant reduction in the quality and number of development issues that can be addressed. He suggests an alternative paradigm that sees participation as an end in itself. This is closely related to the paradigm in which empowerment is seen as the true end to participation (Friedman, 1996). The link between empowerment and participation has been shown to exist (Atkinson, 1999; Perkins et al., 1996); however the directness of this link has been questioned by some authors (Somerville, 1999).

In this paper, we attempt to analyse this link by understanding how the introduction of an ICT project has empowered people to participate in development activities. We propose a pragmatic approach by asking people what they are doing when they are involved in participation. The next section discusses Sen’s (1999) capability approach that has been used to evaluate development projects from the human development perspective as the main theoretical lens to capture the concept of empowerment.

Capability Approach

The capability approach (CA) is a broad normative framework for the evaluation of an individual’s well being, social arrangements and the design of policies and proposals about social change in the society (Robeyns, 2005). Sen’s (1999) CA is essentially concerned with “freedom”, which in a broad sense refers to the effective opportunities people have to live the kind of lives they have reason to value. This contrasts with other philosophical approaches that focus on people’s income, expenditure and consumption (Robeyns, 2005). In his well-known book, *Development as Freedom*, Sen (1999) views the expansion of freedom as both the primary end and means of development.

The CA is used in a wide range of fields, most prominently in development studies, social policy, welfare economics, and political philosophy. In IS studies, very few authors have applied the CA (see Madon, 2004; Zheng, 2008). This could be as a result of the difficulty to find a balance between its conceptual richness and its potential to be operationalized for development research and practice (Kleine, 2010). One of the difficulties as explained by Gigler (2004) is that some capabilities are more difficult to measure than others. For example, it is more difficult to evaluate a person’s ability to have self-respect than their ability to read and write. Also a key challenge is the lack of a general set of capabilities that can be used for specific evaluations (Nussbaum, 2000; Alkire, 2002). However Commin (2001) noted that the CA is particularly suited to micro-level studies since the approach focuses itself to a large extent of non-income variables. This paper constitutes a micro-level study and uses the most basic concept of the capability approach in the social studies of ICT in developing countries. This contrasts with its use in more complex and technical applications in economics and other disciplines. The following two sections will introduce four core concepts of Sen’s CA: functionings, capabilities, well being and agency.

Functioning and Capabilities

Capabilities have been referred to as what people are effectively able to do and be (Robeyns, 2005), or the freedom that people have to enjoy valuable beings and doings (Alkire, 2005). These beings and doings are referred to as functionings and are constitutive of a person's well being. Examples of functionings are various states such as being healthy, being literate, resting, being able to travel and so on. Robeyns (2005) explains that the difference between capabilities and realised functionings is between the freedoms or valuable options from which one can choose on one hand and achievements on the other. Moreover, Alkire (2005) noted that it is important to concentrate on capabilities rather than functionings because people value free choice. For example, a person who is fasting is in the state of under nutrition, which may be likened to a person who is starving. But in the one case, the person fasting could eat and chooses not to; whereas the starving person would eat if he/she could (Alkire, 2005).

Well being and Agency

The CA recognises the importance of both agency freedom and well being freedom. A person's capability can be evaluated in relation to his/her well being whether defined in an elementary fashion (nutritional status) or in a more complex manner (self esteem). Therefore, Sen (1999) speaks of well-being freedom or well being achievements. Or capability can relate to agency, one's ability to pursue and realize the goals that he/she values and has reason to value. According to Sen (1999), an agent is someone who acts and brings about change as opposed to someone who is forced, oppressed or passive. Hence, Sen also speaks of agency freedom or agency achievements.

The distinction between agency and well-being and between freedom and achievement can be clarified with an example. Let us suppose Paul and Collins are both successful sports athletes in the United Kingdom. Paul now decides to represent England in the commonwealth games in Nigeria for two weeks where he will have to face life threatening situations due to political instability. He thus makes the choice of trading-off an aspect of his well being (*facing life threatening situations*) to exercise his agency freedom (*representing England*). Collins shares the concern with the high rate of kidnappings in Nigeria, but chooses not to sacrifice his achieved well being (*stable life situation*) for these agency goals (*representing England*). A crucial distinction of the CA which is of importance to the study of the ICT4D is the distinction between commodities (goods and services), functionings (beings and doings) and capabilities. The approach recognizes the significant importance of commodities and that the conversion of goods and services into functionings is influenced by personal conversion factors (metabolism, physical condition, sex, reading skills, intelligence); social conversion factors (public policies, social norms, discriminating practices, gender roles, societal hierarchies, power relations); and environmental conversion factors (climate, geographical location) (Robeyns, 2005). To clarify this connection, Alkire & Deneulin (2009) used a bicycle as an example to illustrate how these different concepts relate. A person may possess or be able to ride a bicycle (*commodity*). By riding the bicycle, the person moves around the city, and it is assumed that the person values this mobility (*a functioning*). However, if the person is unable to ride the bicycle because he/she is not permitted to ride or has no sense of balance (*conversion factors*), then owning a bicycle would not in fact result in this functioning. Hence, in this scenario, the person's own characteristic (*balance*) together with access to the commodity (*bicycle*) creates the capability to move around the city when he/she wishes. Figure 1 below adapted from Robeyns (2005), illustrates these relationships using these key concepts of the capability approach.

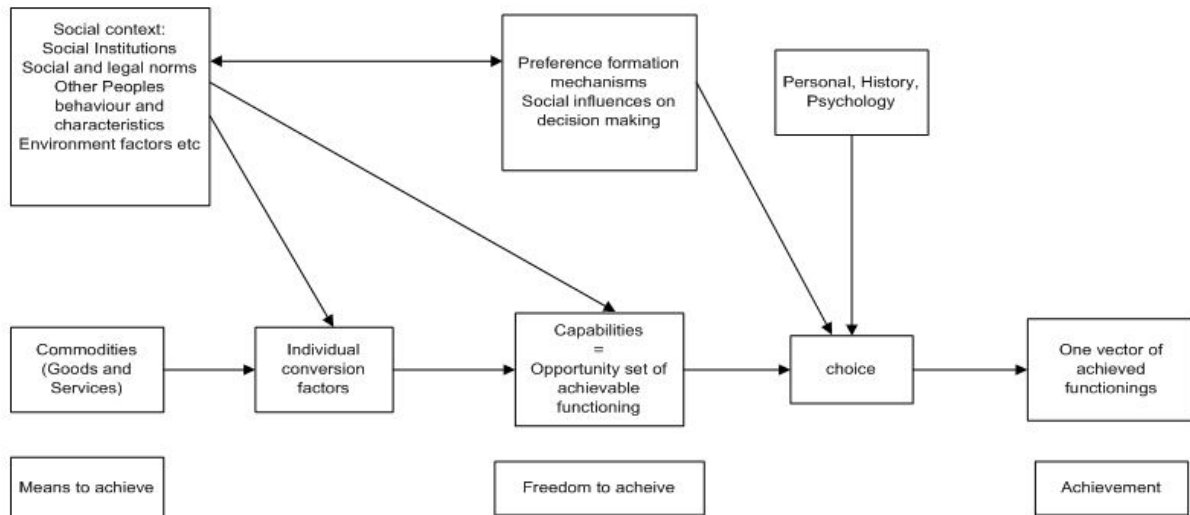


Figure 1. A stylized non-dynamic representation of the key concepts of capability approach (Robeyns, 2005)

The CA has however been deliberately left incomplete as acknowledged by Sen (1999) himself in order for it to be used for a wide range of purposes. In this paper, we attempt to operationalise the CA by understanding how the introduction of ICT has empowered people to participate in development activities.

METHODOLOGY

A broadly interpretive approach was adopted in this study (Walsham, 2006) with the aim of understanding the social context of an IS in use, that is, the social processes by which it is developed and construed by people and through which it influences and is influenced by its social setting (Oates, 2006). The research takes the form of a qualitative case study of the prepaid electricity billing system project in Nigeria. The rationale behind the choice of the Nigeria prepaid electricity billing system is because it is an ICT4D project implemented under the umbrella of the government's rural electrification programme. It also reflects the vision of the national policy of ICT by using IT as the engine of sustainable development and global competitiveness. The research was carried out at the distribution zone of the Power Holding Company of Nigeria (PHCN) in Jos, Plateau State. PHCN is the body in charge of governing the use of electricity in Nigeria. The study was exploratory in nature (Yin, 2003) with the aim of understanding how the introduction of ICT innovations contribute to the empowerment of people to participate in developmental activities such that significant lessons can be learned for both policy and decision makers.

Data collection was conducted via semi-structured interviews and observations by one of the authors, who was introduced to the participants as a researcher who was studying the project in order to write about it. Seventeen face-to-face in-depth interviews were held with various key players (see Table 1) who were involved in the project. Each interview lasted approximately one hour. Also there was an informal observation of the interactions between PHCN workers and the consumers at the PHCN distribution office and also the observation of one bi-monthly meeting between PHCN officials and consumers. Both the interviews and observations were recorded through note takings particularly focusing on the participations of electricity workers and consumers, and the organisational process through which they occur. The data collection was conducted after the prepaid billing system had already been implemented. This was done within a month during the research field work. The data collected were transcribed, the transcripts were carefully read and re-read to allow for the classification of similar material and for insights to be captured (Bryman & Bell, 2007).

Participants Interviewed	Reasons
Head of Technical Operations	Explore his views of the project at operational and management levels
Five PHCN staff	Explore their views based on the direct involvement in the IS implementation
Two Electricians	To elicit information based on work practices on the IS implementation
Entrepreneur	Explore their views based on their direct involvement in the IS implementation
Eight electricity consumers	To get information about their perspective of the system and ascertain its impact

Table 1. Participants interviewed

The data analysis shows that there are various ways of participating in the prepaid billing system project. These various activities were categorised into four main areas of participation in which different people participated in different activities: (i) Participating in the design of the prepaid billing system; (ii) Participating in providing prepaid billing services (iii) Participating in accessing services of the prepaid billing system (iv) Participating in influencing project activities. In the next section, we present the result of the case study analysis using the aspect of the capability approach that looks at the conversion from commodities to capabilities to examine the resources that are necessary for people to have the power to participate effectively in the four areas of participation mentioned above.

CASE STUDY OF PARTICIPATION IN ACTION

Electricity and the Nigeria Prepaid Billing System

Electricity plays a very significant role in the socio-economic and technological development of every country. It is widely accepted that there is a strong correlation between the availability of electricity and socio-economic development (Sambo, 2008). In Nigeria, the central body governing the use of electricity in Nigeria is the Power Holding Company of Nigeria (PHCN) formerly known as National Electric Power Authority (NEPA). It has distribution zones and business units in all thirty-six states of Nigeria to provide adequate electricity supply. However, the majority of the citizens have no access to electricity and those who do are provided with an irregular supply. This is even more chronic in rural areas where the majority of the poor are unemployed and cannot pay their electricity bills. Paying the bills proved to be difficult to the poor since the bills were sent at the end of each quarter and required making a large amount of payment to settle.

As a result of defaulting on their electricity bills, thousands of consumers were disconnected; however, many reconnected themselves illegally. Electricity was being used and not paid for, the lines were overloaded due to illegal connections and this was adversely affecting the distribution of electricity. PHCN were constantly losing revenue that was needed for maintaining existing systems, connecting new consumers and building new plants. In order to increase accountability and transparency in all processes within the power sector, PHCN made a decision for a paradigm shift from the manual billing system to a prepaid billing system - designed to computerise all aspects of electricity billing management particularly to replace the old manual system for its national electrification programme. PHCN registered all homes and corporate organisations where electricity is being supplied to and also installed prepaid meters for the consumers. With the new meters, consumers purchase a voucher containing a 13 digit personal identification number (PIN) at any designated PHCN office. The consumer keys in the pin to the meter and if it is valid, electricity credits are added to the consumer's account. The consumer uses up electricity until his/her account runs out of credits, at which point the electricity supply is interrupted by the meter. The new meter can be likened to the way in which the PAY AS YOU GO mobile works. Also through the introduction of the billing system, PHCN offices are now equipped with intranet, unified e-mail system, and access to internet. As part of the project, PHCN has launched a website where consumers can check their electricity usage, bill, request for a meter, make complaints and also contact their district heads. The website is intended to increase public access to information and encourage participation in national policy processes.

However during the design of the project, the consumers were not involved rather they were only told to use the system after the project had been designed and implemented in exchange for which their debts would be cancelled and a better service delivered. On hearing this information, the consumers welcomed the idea of the prepaid billing system. This study focuses on the participation process that took place between PHCN and the consumers during the introduction of the prepaid billing system in the city of Jos, Plateau State, Nigeria which has a history of illegal connections and/or non-payment of electricity bills. One of the roles of PHCN is to encourage people to change from the analogue meter to the prepaid meter. PHCN made significant efforts to promote the new meter using media such as television, radio, billboards and posters by informing the consumers that with the new meter, consumers would be able to monitor their consumption and budget, eradicate the problems and hassles of disconnections, eliminate debts to PHCN and obtain a constant supply of electricity.

Based on this information, many consumers converted to the new meter. There were also considerable efforts from PHCN in explaining to consumers how to access the prepaid meter service such as buying vouchers, applying for the new meter, making complaints and reporting faults. Existing and new customers frequently accessed these services. To provide effective service delivery using the prepaid meter, PHCN involved its employees in the project by giving them appropriate skills upgrading and training to guarantee sustainable management, maintenance and stable power supply to Nigerians. Some PHCN staff trained to use the computerized sales system in issuing vouchers realized they had the interest to become proficient in computer skills and the ability to enrol for a short-term computer course. PHCN also involved local citizens in the project, job vacancies were advertised in the media to allow locals to participate in the project in terms of installations and supply of the prepaid meters, computers and other electrical appliances. The locals really appreciated the job employment offers, which also boosted economic activities of the communities. A considerable amount of indigenous electricians, usually roadside electricians, that do not have formal education but acquired their skills through vocational training were hired and trained. The majority of the locals employed were on temporary contracts; therefore, they saw this job as a way of enhancing their curriculum vitae. Some were even considering applying for the positions of permanent staff after their contracts were completed.

One of the major challenges of the PHCN officials is to win the trust of the consumers and redeem the image of PHCN. There has been a history of corrupt practices by PHCN officials cheating consumers by sending them over-estimated bills and not even supplying the purchased electricity. PHCN have established a core principle that its officials must be dependable, reliable and provide efficient services or else they would be punished. When indiscretion in the provision of the prepaid meter services occurs, PHCN officials immediately identify the problem and find a solution to it. Also, since the introduction of the prepaid meter, bi-monthly meetings were organised between PHCN and the consumers in order to understand their experiences with the new meter, which would give PHCN significant feedback on how to improve their work. At one of the meetings organized between PHCN and the consumers, the consumers complained that some PHCN staff were making the acquisition of the meter difficult unless a bribe was paid. Another consumer noted that when faults were reported, PHCN electricians hardly came to fix the faults. In reply, a top PHCN official made a promise and guaranteed consumers that all the issues mentioned in the meeting would be taken into consideration and dealt with. The idea of redeeming the trust between PHCN and the consumers provides PHCN officials' ways in which to evaluate the provision of prepaid meter services and to identify problems that needed to be dealt with. Regular meetings to understand consumers experience with the prepaid meter has empowered PHCN officials to reflect on and monitor the prepaid meter services and has also empowered consumers to voice their opinions.

ANALYSIS: AREA OF PARTICIPATION

Participating in the design of the prepaid meter project

The first and crucial domain of participation in the prepaid electricity billing project is the design of the system to make sure it meets the needs of the consumer. Meetings were organised where the participants discussed the role of the project in relation to electricity problems in the country and how the prepaid billing meter should work, and the roles that each of them could play in achieving this agenda. In our case, the participants in this meeting were mostly from the supply-side such as Government officials, PHCN officials and the contracted firms. Taking part in these meetings empowered the participants to understand the project and what it entailed. However, the demand side, mostly the consumers were never involved in these meetings, that is, their needs were not taken into consideration before the design of the system. For example, consumers only heard about the new system when PHCN announced that there was a new billing meter and having it would cancel consumers' outstanding arrears. Hence, the consumers were not empowered to participate in this significant domain, which deprived them the freedom to exercise their agency in this manner. Hence in this case, consumer's non-

involvement in project design is a conversional factor that deprived them the capabilities to be engaged in public affairs and be empowered in this domain of participation.

Participating in providing prepaid meter services

In order to participate in the delivery of project services, participants are required to have the tools to provide these services. For their daily work, PHCN workers were provided with skills upgrading and training to better provide quality services to consumers. An example of this is staff training on how to use the computer for issuing prepaid vouchers to the consumers. Empowering the staff with computer training has enhanced their agency freedom to do their job effectively and has also given them the opportunity to enrol for a short computer certificate course to further improve their computer skills. Also, local indigenous electricians were employed and trained for the installation and maintenance of the prepaid meter. Apart from the electricians, indigenous entrepreneurs were also given the jobs of supplying prepaid meters and other electrical equipment. Empowering the locals through training and job offers has increased their agency freedom in terms of enhancing their curriculum vitae and applying for better jobs in the power sector. Furthermore, it is argued that institutional support has been a key conversion factor in empowering and enhancing people's capabilities to provide project services which has also led to the continued usage and installation of the prepaid meter.

Participating in accessing services of the prepaid billing system

An area of participation in the project is accessing the services which it provides. As seen in the case, consumers frequently visited PHCN distribution centres to purchase their vouchers. Others visited the distribution centre to either apply for a meter or make complaints or suggestions about service delivery. In order for consumers to participate effectively in these ways, PHCN made significant efforts to educate consumers about the new meter, its usage, services and how to access them. Educating the consumers about the usage of the meter has allowed them to monitor their electricity consumption which in turn has increased their well being freedom of saving money. The media campaigns were successful in empowering citizens to exercise their right to access electricity. The key conversion factors that empower consumers to participate in this way are providing services that are worth accessing and creating awareness of the prepaid meter, how it works and how to access the services it offers. This has also led to the continued usage of the prepaid meter by the consumer.

Participating in shaping project activities

Meetings were organised by PHCN and community representatives for a reflective discussion about the prepaid meter project. PHCN usually organised these meetings to discuss consumers' experience with the new meter and areas that need modification to better facilitate electricity delivery. For example, consumers complained that PHCN officials hardly come to repair the meters despite consumers paying monthly maintenance fees. Another consumer complained about PHCN officials making the acquisition of the meter very frustrating. Consumers can only acquire the system when a large bribe is paid and this was causing huge resistance to the system. This stimulated a heated argument over the name of the official asking for the bribe, eventually concluding in an agreement that the matter would be investigated and dealt with. The feedback from these meetings were always taken into consideration and improved upon. In addition, these issues mentioned deprived the consumers their well being freedom of receiving better access to electricity. However, such meetings demonstrated that both PHCN and consumers are empowered to define the ways that would enhance better delivery of the prepaid meter service. Finally, it is argued that involvement of both PHCN and consumers in the discussion meeting is a key conversion factor that empowers both parties to participate in this way. This in return has enhanced people's agency freedom to voice their concerns about the prepaid meter in this domain.

CONCLUSION

Using the aspect of the capability approach that looks at conversion from commodities to capabilities, we were able to identify in this case study the resources that were necessary for people to have the power to participate effectively in each domain of activity. However, we do not claim that the areas of participation identified in this study can be generalized in all other ICT projects nor do we claim that we have covered all the activities that both PHCN workers and consumers are empowered to participate in. We suggest that categorising the activities that would result from the introduction of ICT into the domain of participation in which certain types of empowerment are required would facilitate the design of ICT projects that would meet the needs of the targeted communities.

The introduction of ICT4D projects comes with participatory activities. However, participation is a complex activity, takes place in various settings and for people to participate different resources are required in different settings to empower people to be effective participants. In our case, the non-involvement of the demand side in the design of the project is a conversion factor that led to the capability deprivation of Nigeria citizens to participate in public affairs. In other words, their local needs were not properly accounted for to make the prepaid billing system meaningful to them.

Hence, during the introduction of ICT4D initiatives, policy designers should clearly indicate the powers that would be required for the people to be effective participants. If people are expected to use a certain technology, specific skills and tools are required for them to do so. For example, consumers purchasing prepaid vouchers would not be empowered in the same ways as consumers who are learning how to use the prepaid meter. Asking the question 'empowerment to do what?' of ICT4D projects would facilitate the appropriate design of initiatives that will meet the needs of the people. In suggesting the potential for future research, the limitation of this study is recognised. The study was limited in that only a single focused case study was undertaken under severe time limitations; however, there is scope for undertaking a longitudinal study on the basis of the current results to provide more insight on developmental issues as the country continues to expand the implementation of the prepaid electricity billing system.

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