

THE EXTENT TO WHICH ICT SERVICES OFFERED AT THE HUDUMA CENTRES IN KENYA ARE ACCESSIBLE BY PERSONS LIVING WITH DISABILITY (PWDS)

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Abstract: The purpose of the study was to establish the extent to which ICT services offered at the huduma centres in Kenya are accessible by persons living with disability (pwds). The findings are significant to researchers and academicians; persons living with disabilities; and other stakeholders. The study adopted a descriptive research design. The target population consisted of 2,000 members of the Association of the Physically Disabled in Kenya, 1,500 members of Kenya Society for the Blind, and 1,450 members of Kenya National Association for the Deaf. The study was conducted among a sample of 351 including 142 members of APDK; 106 Members of Kenya Society for the Blind; and 103 Members of Kenya National Association for the Deaf. The main data collection instrument was questionnaires. Collected data was analyzed using SPSS 20 and descriptive and inferential statistics were used to analyze the data. The study found that there is a positive correlation between the extent of accessibility and use of emerging technologies and access to ICT services at Huduma centers by PWD. The study recommends that the government should ensure that people living with disabilities are sensitized on how they should use them effectively to help them access ICT services by the government.

Keywords: ICT Services, Huduma Centres, Persons Living With Disability (Pwds).

1. INTRODUCTION

Information and Communication Technologies (ICTs) have immensely been incorporated into almost every part of our wellbeing. ICT is now a force to reckon with especially in transformation and an integral component of individual and organizational development. It has the capacity to cut costs in terms of coordination, communication and information processing (Brynjolfsson & Hitt, 2000). Information communication technologies have a social, economic, environmental and political impact in modern society (Islam, 2015). There some noticeable strides that have been made in the field of Information Communication and Technology. ICT is one of the key sectors that have built the foundation of our society for socio-political and economic growth. In the National ICT Policy 2016, Kenya has been viewed as a signatory to the United Nations Convention on the Rights of Persons with Disabilities (PWDs), which was adopted by the UN General Assembly on 13th Dec 2006 and came into force on 3rd May 2008.

Historically as reported by Abdalla *et al.* (2016), Kenya has struggled with poor service delivery in public service and has attempted several interventions and strategies to mitigate the problem. The employment of ICT in public services delivery in various sectors is one of these strategies that the Kenya government has been employing to enhance efficiency in public service. Kamau and Wausi (2015) observed e-government has the potential to enhance efficiency, effectiveness, accountability, and transparency in service delivery. Otieno & Omwenga (2015) suggest that the use of e-government can assist governments to regain public trust and confidence in public services which are often viewed as poor by many citizens. There are various e-government benefits to citizens as identified by Mitra (2006) which include: availability of services round the clock; economical to use; fast and efficient service delivery; increased transparency; equitable and convenience.

The UN Convention stipulates that Persons with Disabilities have a right to access to information through different mediums with Article 9 covering accessibility including ICTs. The World Health Organization estimates that about fifteen percent of the world's population has some type of disability, hence the need to take into consideration accessibility aspects for person disabilities when designing ICT technologies. With this in mind we can comprehend that for most people, technology makes things easier. For people with disabilities, technology makes things possible. The exclusion and marginalization of persons with disabilities is a human rights issue as well as an economic issue for countries.

Today, at least 15% of the world population is living with disabilities which translates to 15 billion people, the World Disability Report, published by WHO and World Bank it states that over 80% of these people live in isolated rural areas in developing countries where 2% of these people are educated, however, they face some obstacles in receiving an education, transitioning into the labor market, and becoming economically self-sufficient, it not only undermines their rights and dignity but adds significantly to a country's welfare burden.

Most lives in developing nations, but the number of elderly people is rapidly increasing in populations elsewhere. In order to attain a truly inclusive information society, all people must be in a position to use ICTs with confidence. This implies that enhancing "accessibility" of ICTs must be a main agenda for providers of ICTs equipment and services. It was proposed that a new article covering this issue should be added to the International Telecommunication Regulations (ITRs) during the review at the 2012 World Conference on International Telecommunications. The new provision was aimed to encourage national governments to come up with ICT and global telecommunication services as per the technical standards that ensure accessibility. This is in line with Article 9 of the UN Convention on the Rights of Persons with Disabilities, which promotes the use of ICTs to enable everyone to participate fully in society, on an equal basis with others. ITU's Telecommunication Standardization Sector has enabled standardization of relay services to help deaf people use telecommunications. It has also issued a Telecommunications Accessibility Checklist, which helps experts who develop technical standards to consider the need for people with restricted accessibility. The work by ITU's Radio communication Sector and Telecommunication Development Sector focuses on such topics as wireless communication systems for people with impaired hearing; captioning of television broadcasts; sharing information on best practice in accessibility, and supporting training initiatives. Besides, an online "Toolkit on e-Accessibility and Service Needs for Persons with Disabilities" has been produced. It guides the regulators and policy-makers.

During the second meeting of the Internet Governance Forum in 2007, ITU organized a workshop that dealt with the accessibility of the web and emerging technologies. The workshop pooled together experts from all over the world. The outcome of the workshop was the formation of the Dynamic Coalition on Accessibility and Disability, whose objective was to ensure that the topic is included in key debates concerning the Internet. Several innovations such as touch-sensitive computer screens and automatic door openers were initially created as assistive technologies. However, there is more to enhancing accessibility to ICTs since it is not limited to addressing the needs of people with disabilities. The ultimate aim is to ensure products, facilities, services are usable by as many people as possible. It is an issue of importance to us all.

Various governments have different legal frameworks that govern them through the use of ICTs. In Uganda, disability is a condition which denies a person a normal economic and social life, which has lasted or is expected to last 6 months or more, where cases of epilepsy and rheumatism are classified as disabilities while internationally they are not. The Ugandan government has enacted policies and laws to address access to ICTs by PWDs, but there are still challenges when it comes to implementation and making sure that PWDs benefit from ICTs programs and initiatives. The Disability Act 2006 Section 21 of Uganda requires the government to promote the rights of Persons with Disabilities to access information via the development and use of sign language, tactile and sign language interpreters in public functions; Writing public information like government newspapers government documents and other publications. Besides, in Sub-section (2) that it stipulates that anyone who owns a TV station shall provide sign language inset or subtitles in at least one major newscast program every day and in all special programs considered of national significance.

The Communication Act Cap 106 of Uganda, Specific to PWDs, the Act stipulates that the Commission shall promote research into the development and use of technologies including those which promote accessibility of hearing-impaired people to communication services. Uganda has the following policy goals that seek to address ICT accessibility for Persons with Disabilities; to ensure the ubiquitous presence of telecommunications infrastructure services that will enable sustainable human development through ease and affordability of access to relevant, accurate and timely information (actual content is the responsibility of the various public sectors as well as civil society and private sector initiatives. To

facilitate the delivery of the high-level information and service needs to all sectors of society, especially the marginalized sections of society people with disabilities through close integration with the following:- IT sector, broadcasting sector, media sector, and postal sector; This has been achieved through the administering of a universal access fund by the Uganda Communications Commission among others. Under this fund, a number of projects have been implemented including Internet Points of Presence (PoPs) at District level, Universal Access Telephony in underserved areas, Multi-Purpose Community Telecenters, and District web portals among others. To ensure that all aspects of processes and operations in the sector take full account of the following cross-cutting issues: gender concerns, physically disadvantaged and sustainable exploitation of the environment.

In South Africa, the constitution protects the right of people living with a disability where the government and state bodies have a responsibility to promote and protect their fundamental rights. The South African disability strategy standard rules imply a strong moral and political commitment by the State that should offer an instrument for policy-making and action. The national mechanisms are of close collaboration between the State and other organs which include UN, NGOs, and DPOs which critically outlines the socio-economic policies that run around PWDs.

Through public education and awareness on PWDs, the general public have different perception of PWDs this may include negative attitudes towards PWDs which lead to social exclusion and marginalization; some are viewed as helpless and dependent, however, the South African government has initiated public awareness programs that will raise awareness of disability as a human right and development issue.

Mashangoane (2012), states that assistive technology enables PWDs to participate on equal terms as able-bodied citizens, however, they should have appropriate and affordable ICT technologies for them to be able to access their rights. Further, initiatives to develop appropriate ATs have taken place but they should be standardized for greater capability. Communications is also an important aspect of access to public services, interpreter services should be linked closely to the communication needs of PWDs. Technology that will ensure inclusive use of public amenities by all citizens is required and should be standardized, this can only be achieved when developed and published regulations to regulate ICT industry can be introduced which will see the protection of PWDs citizens and promote competition among the telecommunication field.

2. STATEMENT OF THE PROBLEM

Statistics indicate that there are an estimated one billion persons living with disabilities, with approximately 80% of them in developing nations. Jaeger and Matteson (2009) alluded that for ICTs to be considered accessible they should be allowed access to all users and be compatible with assistive devices and technologies that PWD may use. Quite a number of scholars have explored the relationship between PWD and their access to various ICTs in Kenya. According to Njoka (2012) report, it emphasizes on promoting accessing of ICT services for PWD showed that illiteracy; lack of a productive technology to assist the disabled; inadequate of explicit intervention techniques by the state; many of the disabled persons thrive in rural and underdeveloped areas of the country with poor coverage of the existing ICT infrastructure and distinct designs of ICT components not good for application by disabled persons were challenges to ICT accessibility.

Osman (2015) agrees that ICT performs an important function in the lives of persons with disabilities. However, they encounter a number of challenges in accessing ICT services. Therefore, ICT is regarded as a successful mediator in empowering some of the marginalized communities and individuals in Kenya. Concerning the empowering of disabled persons in employment, the research presumes that ICT is instrumental in this respect. Since ICT proficiency is now among the most fundamental skills to compete in the business environment, training of disabled individuals in this field is required as soon as possible.

There are several accessibility standards for ICT products and services that measure accessibility through checklist attributes such as the Web Content Accessibility Guidelines (WCAG 2.0). However, for most ICT products or services, there is still no set of internationally agreed standards although there are several attempts by various stakeholders to implement them. While most governments are striving to provide e-government services to their citizens, there is a growing concern that not all citizens are part of this transformative agenda leading to some form of exclusion in this information age. Today, one demographic group that is attracting a lot of interest as related to their general welfare is the people living with disabilities. Recent surveys show that an estimated 1.3 million Kenyans live with vision, hearing, mobility or cognitive disabilities. The Constitution of Kenya section 54 article 1(c) stipulates that a person with any disability is entitled to reasonable access to all places, public transport, and information. In the same section, article 1(d)

states that PWD is entitled to access assistive devices and technologies to reduce constraints arising from the person's disability.

Moreover, with increasing recognition for the rights for disadvantaged groups such as persons living with disabilities and the elderly in the society, there is a need for governments to ensure reasonable access to all in e-government services. Nonetheless, Williams et al. (2006) pointed out that there is a shortage of Special education needs exploration into applicability, to disabled individuals, and even less regarding people with learning challenges. In acknowledging the importance of ICT in assisting disabled persons to be self-sufficient and in allowing them to be incorporated in the mainstream society, the study seeks to investigate access to ICTs among PWD at Huduma centre where the government goal is mainstreaming disability where it seeks to make sure that problems that immediately impact them are sufficiently eliminated by the introduction of policies, legal structures, and programs.

With the introduction of Huduma Centres in Kenya, it is important to know whether PWDs are accessing ICT services at these centers and if not what needs to be done to ensure reasonable access to them. This study, therefore, will aim at establishing the extent to which the services offered at these centers are accessible to PWD, investigating the challenges faced by PWD in accessing the ICT services and suggesting ways to expand access to these services by PWD.

3. LITERATURE REVIEW

With various ICT services being offered at the Huduma Centre, the extent of compatibility and usability with assistive technology is important. This should accommodate the PWD, where there should be provision of text representations of both the visual and audio features, the extent of the cognitive and other demands and memory requirements, provision of sign language and other communication and moreover this should be supported by the ability to turn to stimulation e.g. animation, sound effects, etc. The design of the emerging communications technology should take into account user diversity in that there should be consideration PWDs age, gender, the culture within the main target audience (Petrie and Bevan, 2009). The type of technology should be flexible in that platform independence is available or there is a compatibility range of different platforms.

Availability of internet services in contemporary society has become fundamental for continued personal development and growth. According to Chadwick, Wesson, and Fullwood (2003), ICT can be perceived as a fundamental element in the contemporary world. Many people are going online for a number of purposes such as learning, commercial objectives, data searching, employment, making new friends and searching for love. Therefore, the digital connection is very important to individuals and the entire economy (Shapiro & Rohde, 2000).

In the literature, a huge proportion of explorations on internet accessibility mainly focus on disability. Fox (2011) found a "disability divide" in web accessibility in America, around 80% of the able-bodied individuals accessing the internet compared to 54% by the disabled. A United States research discovered a big difference between households governed by a disabled person and those by a non-disabled person in technology possession (53% against 79%), web application (48% vs. 76%) and broadband usage (46% against 73%). A British study revealed that disabled persons have a higher probability of never accessing the World Wide Web contrasted to able-bodied people (Dutton & Helsper, 2007). A recent study in the UK found out that disabled people are three times more probable to have never used the internet compared to non-disabled people (Chadwick et al., 2013).

In South Africa, Mashangoane (2012) found that only 57 % of disabled persons have a mobile handset. Price is the fundamental catalyst of choice by service providers; individuals with physical and sight issues has a higher chance of using public utilities than those hearing and communication challenges. Community service phones were found to be within a walking distance from PWD's homes. Community service telephones are normally close to the disabled's household (Ramps, assistive technologies)

In Kenya, Murugami and Mazrui (2012) conducted a study on hindrances to web access for disabled individuals. They encompassed unavailable aspects of the social channels; some of the barriers included inaccessible aspects of social networks; improper layout and format; a web design restricting customization and shortage of relevant items for audio purposes. The KNHRC (2014) found that PWDs faced challenges to access to communication job data like announcements of vacancies in incomprehensible and structures via the internet and newspapers which a majority could not obtain. The report found that the means of relaying information on latest employment opportunities has been barring a number of advertisements in print media and through the World Wide Web rendering the disabled persons obsolete.

Vicente and Lopez (2009) study found that disabled people have a lower chance of using the web despite higher levels of income and education. As such, it need not be regarded as a sign of incapability. As a matter of fact, it can be regarded as an indication of issues of accessibility. Studies have revealed that around 5.3% of the state websites and other commercial sites in the EU are entirely in line with the fundamental accessibility requirements.

In a study on exploiting ICT for empowering people with disabilities in India, Singh (2013) recommended that for the visually impaired that manufacturers could introduce accessibility features such as flexibility for adjustment of font size, screen readers, clear audio and large button phones. Singh recommended that for those with hearing impairments we could adopt extra loud ringing tones, captioned telephony relay service, sign language via video calls, audio amplification and voice recognition software for people with disability who use keyboard gadgets.

4. METHODOLOGY

The study adopted a descriptive research design. The target population consisted of 2,000 members of the Association of the Physically Disabled in Kenya, 1,500 members of Kenya Society for the Blind, and 1,450 members of Kenya National Association for the Deaf. The study was conducted among a sample of 351 including 142 members of APDK; 106 Members of Kenya Society for the Blind; and 103 Members of Kenya National Association for the Deaf. The main data collection instrument was questionnaires. Collected data was analyzed using SPSS 20 and descriptive and inferential statistics were used to analyze the data.

5. FINDINGS

The study to establish whether the respondents had ever sought ICT related services at the Huduma centers portal. The findings are presented in Figure 1.

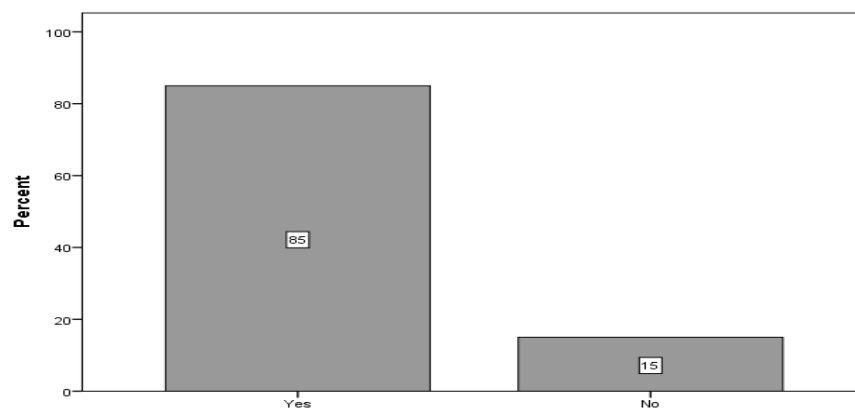


Figure 1: The respondents had ever sought ICT related services

The results presented in figure 4.6 revealed that majority of the respondents (85%) has sought ICT related services in the past at Huduma center portal while only 15% who had not sought the ICTS related services in Huduma centers portal. Further, the study sought to know how the respondents who indicated yes, would rate the level or extent of accessibility of the services. The results are presented in figure 2.

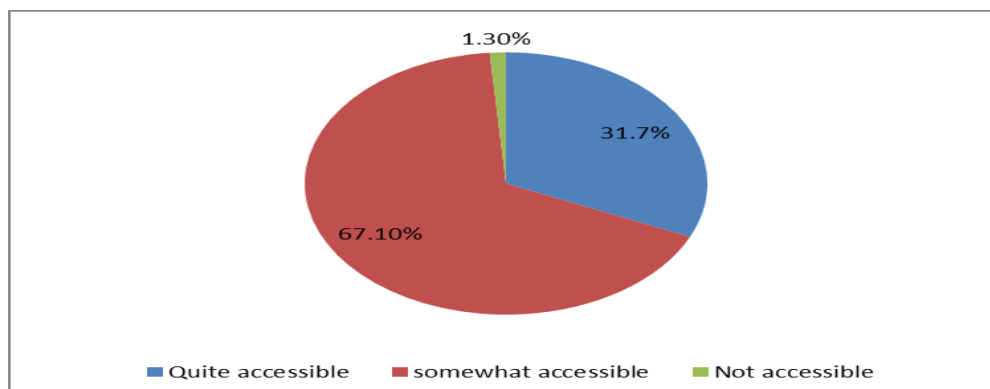


Figure 2: The extent of accessibility of ICT related services

The results revealed that the ICT related services were accessible at Huduma center portals as presented by 67.10% who indicated that the services were somewhat accessible and 31.7% who indicated that the services were quite accessible. On the other hand, 1.30% noted that ICT related services were not accessible to them.

Table 1: Descriptive statistics for accessibility of ICT services

Statements on the accessibility of ICT services						Mean	Standard Deviation
	Strongly disagrees (1)	Disagree (2)	Neither agree nor disagree (3)	Agree (4)	Strongly agree (5)		
The environment and facilities at Huduma Centres are conducive for PWD seeking e-government services	9.2	37.5	25.0	22.5	5.8	2.78	1.08
There are infrastructure that assists PWD at Huduma Centres	6.3	43.3	24.2	23.8	2.5	2.73	0.98
The Huduma portal system is accessible and usable by PWD	9.6	31.7	31.7	24.6	2.5	2.79	1.00
PWD can access and use e-government services to achieve their specified goals effectively and efficiently.	15.4	22.1	34.6	20.4	7.5	2.83	1.15
Aggregate score						2.78	1.05

The findings of descriptive statistics for the accessibility of ICT services show an aggregate mean score of 2.78 and a standard deviation of 1.05. The low aggregate mean score of 2.78 and a high aggregate standard deviation implies that there is a high deviation but the responses are more skewed towards disagree as shown in Table 1. The majority of the respondents were in agreement that the environment and facilities at Huduma Centres are conducive for PWD seeking e-government services as shown by 37.5% who disagreed and 9.2% who strongly disagreed. On the other hand, 22.5% agreed and 5.8% strongly agreed; however, quite a number of participants (25%) neither agreed nor disagreed that the environment and facilities at Huduma Centres are conducive for PWD seeking e-government services.

The majority of the participants (43.3%) agreed and 6.3% strongly agreed that there is infrastructure that assists PWD at Huduma Centres. However, 23.8% of the participants agreed and 2.5% strongly agreed, but 24.2% neither agreed nor disagreed that there is infrastructure that assists PWD at Huduma Centres. The results further revealed that 31.7% of the participants disagreed, 9.6% strongly disagreed, 24.6% agreed, 2.5% strongly agreed, but 31.7% neither agreed nor disagreed that the Huduma portal system is accessible and usable by PWD.

Besides, the results revealed that the majority of the participants (34.6%) neither agreed nor disagreed; 22.1% disagreed, 15.4% strongly disagreed, 20.4% agreed while 7.5% strongly agreed that PWD can access and use e-government services to achieve their specified goals effectively and efficiently.

The researcher further sought to establish the extent to which the challenges of accessibility affect the respondent's general usage of e-government services in Huduma centers. The findings are presented in Table 2.

Table 2: Extent to which challenges of accessibility affect usage of e-government services

Extent	frequency	Percentage (%)
Not at all	12	5
Small extent	14	5.8
Moderate extent	89	37.1
Great extent	117	48.8
Very great extent	8	3.3
Total	240	100.0

The results presented in Table 2 revealed that the challenges of accessibility affect usage of e-government services. This is based on the majority responses where 48.8% indicated that the challenges affect the usage of e-government services to a great extent, 37.1% to a moderate extent, 3.3% to a very great extent, 5.8% to a small extent, and 5% not all.

The results also indicated that most of the participants had computer experience and had access to emerging technologies since they had access to internet and computer services. The results of the regression analysis revealed that there is a positive correlation between the use of emerging technologies and access to ICT services at $\beta=0.104$; $t = 1.076$; $p = 0.283$. This implies that an increase in the extent of accessibility and use of emerging technologies would lead to an increase in access to ICT services at Huduma centers by PWDs.

6. CONCLUSION AND RECOMMENDATION

the study concluded that the extent of accessibility and use of emerging technologies positively affects access to ICT services by PWDs at Huduma Centres. It is, thus, important to ensure that PWDs are in a position to use the emerging technologies that can be used to enhance access to ICT services. Based on the findings and the above conclusion, the study recommends that the government should not only install emerging technologies at public places but should also ensure that people living with disabilities are sensitized on how they should use them effectively to help them access ICT services by the government.

REFERENCES

- [1] Abascal, J. *et al.* (2016) 'Rethinking universal accessibility: a broader approach considering the digital gap', *Universal Access in the Information Society*. Springer Berlin Heidelberg, 15(2), pp. 179–182.
- [2] Abdalla, A. G., Kiragu, J. K., Waswa, F. A., Ono, F. T., Kariuki, J. W., & Ikuu, D. M. (June 2015). Effect of Huduma Centers (One Stop Shops) in Service Delivery – A Case Study of Mombasa Huduma Centre. *International Journal of Academic Research in Business and Social Sciences*, 102-117.
- [3] Agangiba M. Kabanda S. & Brown, I. (2018). Experiences of Persons with Disabilities in accessing E-Government Services in Ghana. *Twenty-Sixth European Conference on Information Systems (ECIS2018)*, (pp. 1-16). Portsmouth, UK.
- [4] Bekteshi, L. (2015). Information and Communication Technology and Students with Disabilities, *European Scientific Journal*, 11 (22), 337-341.
- [5] Brajnik, G. (2008). Beyond Conformance: The Role of Accessibility Evaluation Methods. *Web Information Systems Engineering–WISE 2008 Workshops*, 63-80.
- [6] Chadwick, D., Wesson, C. & Fullwood, C. (2013). Internet Access by People with Intellectual Disabilities: Inequalities and Opportunities, *Future Internet*, 5, 376- 397.
- [7] Cooper, D.R., & Schindler, P.S. (2011). *Business Research Methods*, 11th, edition. McGraw-Hill Publishing, Co. Ltd. New Delhi-India.
- [8] Dutton, W. & Helsper, E. J. (2007). *The Internet in Britain in 2007*. Oxford Internet Institute: University of Oxford. The United Kingdom.
- [9] Foucault, M. (1965). *Madness and civilization: a history of insanity in the Age of Reason*. New York, NY: Vintage.
- [10] Fox, S. (2011). Americans Living with a Disability and Their Technology Profile. Washington, DC: *Pew internet Future Internet*, 5,376-397.
- [11] GoK. (2009). *Environmental Factors Affecting Persons with Disabilities*. Nairobi : National Coordinating Agency for Population & Development.
- [12] GoK. (2014). *National Cybersecurity Strategy 2014*. Retrieved November 6, 2018, from ICTA Website: <http://www.icta.go.ke/cybersecurity-strategy-2014/>
- [13] Government of Kenya (2013). *The Kenya Vision 2030: Second Medium Term Plan 2013-2017*. Nairobi. Government Printers.
- [14] Grantham, J., Grantham, E. & Powers, D. (2012) 'Website accessibility: an Australian view', in In Proceedings of the 13th Australasian *User Interface Conference*, p. 126 (pp. 21-28).

- [15] Guo, B., Bricout, J. C. & Huang, J. A. (2005). Common open space or a digital divide? A social model perspective on the online disability community in China. *Disability Sociology*, 20, 49–66.
- [16] Heap, N., Thomas, R., Einon, G., Mason, R. and Mackay, H. (1995). *Information technology and society: A Reader*. London, UK: Sage/Open University.
- [17] Henry, S. L. (2019, January 6). *Just Ask Integrating Accessibility Throughout Design*. Retrieved from Evaluating for Accessibility: <http://uiaccess.com/accessucd/evaluate.html>
- [18] Hersh, M. (2014). Evaluation framework for ICT-based learning technologies for disabled people. *Computers & Education*, 30-47.
- [19] *In Non-Governmental Organizations In Kenya*. Nairobi Kenya: Unpublished Ph.D. work, JKUAT.
- [20] International Labour Organisation. (2002). *Managing disability in the workplace. ILO code of practice*. Geneva: ILO.
- [21] Islam, R. M. (2015). Rights of the People with Disabilities and Social Exclusion in Malaysia, *International Journal of Social Science and Humanity*, 5 (2), 171-177.
- [22] ITU. (August 2008). *Electronic Government for Developing Countries*. Geneva: ITU.
- [23] Jacard, J. & Jacoby, J. (2010). *Theory Construction and Model-Building Skills: A Practical Guide for Social Scientists*. New York, NY: Guilford
- [24] Jaeger, P. T. (2006). Telecommunications policy and individuals with disabilities: Issues of accessibility and social inclusion in the policy research agenda, *Telecommunications Policy*, 30, 112–124.
- [25] Jaeger, P., & Matteson, M. (2009). E-Government and Technology Acceptance: The Case of the Implementation of Section 508 Guidelines for Websites. *The Electronic Journal of e-Government*, 87-98.
- [26] Kamau, G., & Wausi, A. (2015). Evaluating the Public Value of eGovernment Services. *IST-Africa 2015 Conference Proceedings*. Dublin: IIMC International Information Management Corporation.
- [27] Kbar, G., Aly, S., Elsharawy, I., Bhatia, A., Alhasan, N. & Enriquez, R. (2015). Smart Help at the Workplace for Persons with Disabilities (SHW-PWD), *International Journal of Computer, Information, Systems, and Control Engineering*, 9 (1), 84-90.
- [28] Kombo, D. K., & Tromp, D. L. (2006). *Proposal and Thesis Writing. An Introduction*. Pauline's Publication in Africa.
- [29] Kothari, C. R. (2004). *Research methodology. Methods and techniques*. New Delhi. New Age International (P) Limited Publishers.
- [30] Kunstelj, M., Jukić, T., & Vintar, M. (2007). Analyzing the Demand Side of E-Government: What Can We Learn From Slovenian Users? *6th International Conference, EGOV 2007*. Regensburg, Germany: Springer Berlin Heidelberg.
- [31] Mackelprang, R. W. & Salsgiver, R. O. (1998). *Disability: A Diversity Model Approach in Human Service Practice*. Washington, DC: Lyceum.
- [32] Mashangoane, P. (2012). Accessibility to ICT Services by Persons with Disabilities – South African. <http://www.un.org/disabilities/documents/egm2012/pdf> accessed March 15, 2018.
- [33] Misra, D. C. (2006). Defining e-government: a citizen-centric criteria-based approach. *10th National Conference on e-Governance*. Bhopal, Madhya Pradesh, India: C-183 Madhuvan, Madhuvan Marg, New Delhi-110 092.
- [34] Mitra, S. (2006). The Capability Approach and Disability. *Journal of Disability Policy Studies*, 16 (4), 236–247.
- [35] Mugenda, A. G., & Mugenda, O. M. (2012). *Research Methods Dictionary*. Nairobi: Applied Research & Training Services.
- [36] Mujahid, D. & Kabanda, S. (2017). *E-Government in Africa: Perceived Concerns of Persons with Disabilities (PWDs) in South Africa with regards to accessibilities of Services*. Cape Town: University of Cape Town.

- [37] Murugami, M. & Mazrui, L. (2012). Barriers to Internet Access for Persons with Disabilities. *Special Needs Education. Kenyatta University*. Nairobi.
- [38] Njoka, C. (2012) *Research on promoting accessibility to ICT services for PWDs. accessibility Workshop for People with disabilities*. Laico Regency Hotel, Nairobi Kenya 10-11th May 2012
- [39] Ong'eta, W. & Nyambura, S. (2012). *Use of ICT to Promote Access and Participation of Students with Disabilities in Higher Education: Benefits and Challenges*. Department of Educational Foundations, Kenyatta University.
- [40] Osman, O. M. (2015). ICT Competency and Employment among Malaysian PWDs (People with Disabilities). *Proceeding of International Conference on Information Technology & Society 8-9th June, Kuala Lumpur, Malaysia*.
- [41] Otieno, I., & Omwenga, E. (2015). Citizen-Centric Critical Success Factors for the Implementation of E-government: A Case Study of Kenya Huduma Centres. *IST-Africa 2015 Conference Proceedings*. Dublin: IIMC International Information Management Corporation.
- [42] Palmer, S. B., Wehmeyer, M. L., Davies, D. K. & Stock, S. E. (2012). Family members' reports of the technology use of family members with intellectual and developmental disabilities. *J. Intell. Disabil. Res.* 56, 402–414.
- [43] Parsons, S., Daniels, H., Porter, J. & Robertson, C. (2008). Resources, staff beliefs, and organizational culture: Factors in the use of information and communication technology for adults with intellectual disabilities. *Journal of Applied Research and Intellectual Disability*, 21, 19–33.
- [44] Petrie, H., & Bevan, N. (2009). *The Universal Access Handbook, C Stepanidis (ed): The Evaluation of Accessibility, Usability and User Experience*. London: CRC Press.
- [45] Pilling, D. and Boeltzig, H. (2007) 'Moving Toward E-Government – Effective Strategies for Increasing Access and Use of the Internet Among Non- Internet Users in the U. S. and U. K .', in Proceedings of the 8th annual international conference on Digital government research: bridging disciplines & domains, pp. 35–46.
- [46] Saunders, M., Lewis P. & Thornhill, A. (2007). *Research Methods for Business Students* (5th edition). New Jersey, NJ: Prentice Hall.
- [47] Sen, A. K. (2002). Why health equity? *Health Economics*, 11, 659–666.
- [48] Shapiro, R. J. & Rohde, G. L. (2000). *Falling through the Net: Toward Digital Inclusion; A report on American's access to technology tools*. Washington, DC: The Secretary of Commerce.
- [49] Singh, J. (2013). Exploiting ICT for Empowering People with Disabilities (PWDs), *Indian Journal of Inclusive Growth*, 1 (1), 113-119.
- [50] Smyth, R. (2004). Exploring the usefulness of a conceptual framework as a research tool: A researcher's reflection. *Issues In Education Research*, 14(2), 167-180.
- [51] Toboso, M. (2011). Rethinking disability in Amartya Sen's approach: ICT and equality of opportunity, *Journal of Ethics and Information Technology*, 3 (2), 107-118.
- [52] Torraco, R. J. (2004). Challenges and choices for theoretical research in human resource development. *Human Resource Development Quarterly*, 15 (2), 171-188.
- [53] Vicente, M. & López, A. (2010). A Multidimensional Analysis of the Disability Digital Divide: Some Evidence for Internet Use. *The Information Society*, 26 (1), 48 - 64.
- [54] Vygotsky, L. S. (1978). *Mind in Society*. Cambridge, UK: Harvard University Press.
- [55] Webster, F. (1995). *Theories of the information society*. London, UK: Routledge.
- [56] Williams, P., Jamali, H. R. & Nicholas, D. (2006). Using ICT with people with special education needs: what the literature tells us, *Aslib Proceedings*, 58 (4), 330 – 345.
- [57] Zahid, J. A., Ashraf, M., Malik, B. T., & Hoque, R. (2013). Information Communication Technology (ICT) for Disabled Persons in Bangladesh: Preliminary Study of Impact/Outcome. *IFIP AICT*, 652-657.