DIGITAL INCLUSION PRACTICES AND TECHNOLOGY ACCESSIBILITY PERFORMANCE FOR PEOPLE WITH DISABILITIES IN TERTIARY EDUCATION INSTITUTIONS IN NAIROBI COUNTY

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ABSTRACT

Technology has become an integral part of our social and economic landscape. Its benefits offer a wide range of opportunities with ICT providing tools and platforms for PWD to interact socially just like the rest of the population. With over 0.9 million people living with disabilities in Kenya, and one in five Kenyans using the internet, there is a need to investigate the impact of digital inclusion practices on technology accessibility. This study aimed to examine digital inclusion practices and technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County. Specifically, this study determined the influence of digital access, found out the impact of digital usability, analysed the influence of ICT capacity building, and established the influence of the regulatory framework. The study used a descriptive research design to describe, explain, and validate its findings. The scope of this study was limited to persons with disabilities registered by the National Council of Persons with Disabilities learning or working in tertiary institutions in Nairobi County with visual, hearing and mobility or dexterity disabilities. The target population of the study were registered PWD who are Students, Faculty members, Administrative staff, and Support staff in tertiary institutions in Nairobi county. The tertiary institutions that participated in the study were selected using stratified sampling technique. The study used the non-probability sampling method, purposive sampling technique to justify the selection of the respondents from tertiary institutions. The collected data are analyzed using descriptive and inferential statistics. The results are be represented in bar graphs, pie charts, and histograms. The research instrument was tested for reliability and validity during the pilot study. The questionnaire was pilot tested and administered to 10 respondents. The items had a factor loading above 0.5 and a Cronbach Alpha value greater than 0.8. This indicated that the research instrument was reliable and valid and there was no need to change the items. The study on digital inclusion practices and technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County found generally high mean scores for various factors related to technology accessibility. These factors include digital access, digital usability, ICT capacity building, and regulatory framework, which all positively correlate with technology accessibility performance. Regression analysis confirms that these factors significantly impact technology accessibility performance. Specifically, regarding digital accessibility performance, most participants acknowledged the availability of assistive devices, adaptive features, and accessible computer labs for wheelchair users. However, improvements are needed in enhancing website readability, including larger and more recognizable text and images, increasing awareness of ICT accessibility policies, and promoting transparency and fairness in resource allocation for digital inclusion programs. Overall, while progress has been made, further research is necessary to identify other factors influencing technology accessibility performance and create more targeted interventions.

INTRODUCTION

Background of the Study

Digital technology has become an integral part of our society with most if not all services migrating to the internet. According to (Hasan & Himayah, 2022), internet technology led to the development of digital technology which has grown to become a core part of Information Communication Technology (ICT). The significance of digital inclusion and the reduction of the digital divide has been acknowledged by all relevant organizations and leaders. The 17 UN Sustainable Development Goals (SDGs) may not refer to digital inclusion directly but they promote inclusion traditionally marginalized persons and communities while also championing for ICT to be an enabler of the SDGs (UNU-EGOV, 2019). The National Digital Inclusion Alliance (NDIA, 2022) emphasizes that digital inclusion should have activities necessary to ensure all persons and communities including the most disadvantaged have access to and use of ICTs.

According to the (WHO, 2022), there are over one billion people, which accounts for 15% of the world's population have some form of disability. In Kenya, there are over 0.9 million people living with disabilities according to the 2019 census. The government is a key driver of the assimilation of solutions based on ICT, specific to the needs of Persons with disabilities (PWD) through augmentation of accessibility and availability of ICT products and services and promotion of affordable assistive technology in all environments (Omboto & Chege, 2021). ICTs provide tools and mediums to that can enable PWD to effectively interact and participate in the community. According to (Busuulwa et al., 2020), due to technologies that lack "digital accessibility", people with disabilities are not able to use digital technologies such as mobile applications and websites.

The importance of accessibility to technology became apparent during the COVID-19 pandemic where the ownership of mobiles and connectivity to the internet was determined as one of the main reasons for not collecting data on vulnerable people such as PWD (UN, 2022). ICT accessibility works together with assistive technologies to give PWD to access various technological innovations. The results of the 2019 census detailed that around 0.7 million PWD are living in rural areas compared to the 0.2 million living in urban areas. Further tallies show that every one in five Kenyans has access to the internet with over 22.6% of population aged above 15 years utilizing the internet (Owino, 2020). This has increased the urgency to ensure that PWD are well equipped to access ICT, create equity which in turn will reduce the stigma against them.

A Memorandum of Understanding (MOU) between the NCPWD and the Communication Authority (CA) aiming to engage PWD in a 2-year project on enhancing accessibility to digital services and promote their contribution and participation in the ICT sector NCPWD, (Usawa na haki, 2022). The Kenya Bureau of Standards (KEBS, 2022) accessibility standards outline the

accessibility conformance of ICT products and services indicates the standards for ICT accessibility features, web page conformance requirements, software that promotes accessibility and interoperability with assistive technology. The NCPWD in its disability mainstreaming performance indicators report (NCPWD, 2022), states its aim to upgrade websites to follow the Web Content Accessibility Guidelines (WCAG) to promote accessibility for PWD.

Global perspective of digital inclusion practices

The internet has become a large part of our present day to day lives in both large and small cities by providing the population with connectivity and access to information that can be used for various purposes. According to (Sant'Ana et al., 2021), digital inclusion can be referred to as the access to assets in information technology such as hardware infrastructure, software, networking devices and even buildings. The ubiquity of mobile technology and the internet has given an opportunity for people to access and utilize technology for innovations that promote development (Adam & Dzang Alhassan, 2020). As a result, there has been diffusion of ICTs which has spurred accessibility of various devices and in turn increase in usage of technology and internet. To meet the UN 2030 goal for meaningful connectivity, countries are aiming to attain digital accessibility which will ensure that the development of ICTs takes into consideration the abilities and needs of all people which results in the reduction of the digital divide and inclusive communication for all.

A report on internet usage by the International Telecommunication Union (ITU, 2022) shows there has been a steady increase in internet usage with an approximately 5.3 billion people, which accounts for 66% of the population, utilizing the internet. There is significant growth in the world internet usage of 6.1% from 2021 but it does not surpass the 11% increase in internet usage recorded in 2019-2020 during the COVID-19 pandemic. There are still 2.7 billion people who are offline leaving much to be done so as to realize the United Nation 2030 goal to ensure every person has access to safe and affordable internet. To eliminate this digital divide, a global framework has been proposed with the aim to assess the state of digital inclusion especially within traditionally excluded groups (UNU-EGOV, 2019). The global framework will take into consideration four key aspects to measure digital inclusion; Access to electricity, internet and devices, digital skills and digital literacy, usability of technology and digital content and a conducive environment in terms of policies and affordability.

Worldwide advocacy for increased ICT accessibility for PWD started with the United Nations CRPD (Narasimhan, 2020). ICT accessibility can be categorized as the availability and design of information and communication services and products for all users inclusive of those who with varying abilities to operate the devices. To enable stakeholders to measure the progress of making ICTs accessible for all, the Global Initiative for Inclusive ICTs (G3ict) created a benchmarking tool called the Digital Accessibility Rights Evaluation (DARE) Index in line with CRPD's article

9. The DARE Index asses over 137 countries according to regions, Income levels and Human Development rankings (G3ict, 2020). In comparison, the inclusive internet index by the Economist Intelligence Unit (EIU) aims to measure internet accessibility, affordability, relevance and readiness across 120 countries in the world. Both the DARE index and the inclusive internet index aim to measure accessibility across the globe.

Regional perspective of digital inclusion practices

The use internet is rapidly increasing in Africa. As of 2022, the African region recorded over 570 million internet users out of the total population of 1.4 billion (Saleh, 2020). Digital technology has accelerated growth in the African continent by giving access to information and opportunities such as online jobs, e-learning and access to government services. Digital technologies have become critical to the continued development of the region. The results of the DARE Index 2020, (G3ict, 2020), had the top performing country in the region of Africa, out of the 33 countries that participated, to be South Africa with a score of 75.5/100. Kenya was second with a score of 70/100. The inclusive internet index also ranked South Africa as the most inclusive country in Africa with a score of 73.7, closely followed by Morocco, Egypt, Kenya and Nigeria as the top performing nations in Africa with a score ranging from 63 to 68 points (Saleh, 2022).

According to the World Bank, over one billion persons are living with disabilities in the world and around 80% of them are in developing countries. The (World Bank, 2020) report highlights that there are higher rates of disability in rural areas compared to urban areas with PWD having lower levels of education and the rate of disability being higher for older persons. To this effect, in 2006, the United Nations created a document called the Convention on the Rights Persons with Disabilities to ensure that the rights of people with disabilities are protected (UNCRPD, 2022). The rise in internet usage can be attributed to the development of the telecommunication infrastructure and the rise in the rate of mobile phone adoption. Although there is an increase in internet penetration and accessibility in the region, the ICT infrastructure in Africa is still scarce compared to other developed regions in the world (Saleh, 2020). There is a great potential for digital technology to assist PWD as digital accessibility can be defined as a link of dependent relationships where hardware, software, content, training and standards work hand in hand (Botelho, 2021).

Local perspective of digital inclusion practices

The republic of Kenya can be considered as the digital leader for the East African community (EAC). The Kenyan government has put in place various policies and strategies to provide a supportive environment for service providers and network infrastructure providers to invest in innovative technologies (Khaduli, 2022). The government aims to reduce the gap in digital

inclusion by addressing affordability, digital access, increasing digital skills and relevant content. The National ICT Policy, the Kenya National ICT Master plan and the National Broadband Strategy are some of the policy documents created by the Ministry of Information, Communications and the Digital Economy that show the government's commitment to minimize the digital divide. To effectively address the issue of digital inclusion, the government of Kenya has paid special attention to the vulnerable and traditionally excluded groups in the society that is Persons with disabilities.

On May 19th 2008, the Kenya endorsed the Convention on the Rights of Persons with Disabilities (CRPD) thereby declaring to respect, protect and honour the provisions stipulated by the convention. The convention advocates for inclusion, endorses human rights for all PWD and recommends ways to support the implementation of the provisions enshrined within it. The government has ensured that PWD are all acknowledged and are able to participate in all aspects of society to become productive members. The government has also a commitment in the Global Disability Summit on 24th July 2018 to harnesses technology and innovation for PWD. For example, to enhance inclusivity for PWD, Assistive Technologies (AT) have been created and adopted to give access to various technological products and services. This is in line with the UNCRPD which has a goal to "promote, protect and ensure full and equal enjoyment of the human rights and fundamental freedoms by people with disabilities and respect for their dignity" (UNCRPD, 2022).

The Kenya Bureau of Standards (KEBS) in partnership with inABLE have cooperated with various stakeholders in Kenya, the Communications Authority (CA), the ICT Authority (ICTA) National Council of People with Disabilities in Kenya (NCPWD) to develop Kenya's Standards for Accessibility of ICT products and services to boost the availability of accessible products and services in the private and public sector for PWD to remove their disconnect from e-government services (inABLE, 2022). In 2020, Kenya had a DARE Index score of 70/100 with a global ranking of 11 and a regional ranking of 2 in Africa with South Africa taking the first position with a score of 75.5/100. In the inclusive interned index 2022, Kenya was placed 58th globally and second out of the 26 countries in Sub-Saharan Africa that participated. Kenya has been working towards reducing the digital divide by increasing accessibility.

Tertiary Institutions

Tertiary education refers to post-secondary education given in public and private universities, colleges and technical schools and vocational schools. In Kenya, the Universities are established through the Universities Act no. 42 of 2012 while Technical Vocation Education Training (TVET) institutions are established through the Technical and Vocational Education and Training Act, 2013. Technical and Vocational colleges are institutions that offer technical and vocational

education and training at diploma level while universities are used partly or solely to offer higher education and research which results in the awarding of academic degrees in related academic disciplines. The universities Act clearly outlines the objectives of university educations and the notable objectives relevant to this research are knowledge advancements through teaching, scientific investigation and scholarly research and the promotion of equalization for People with disabilities in the society.

According to (Sayaf et al., 2022), technology aids in providing comprehensive and efficient training to students by stimulating and engaging leaners who are will become technological specialists of the future. The emergence of the internet and the rapid evolution of ICTs has resulted in a technological age with a new type of powered student. According to the Economy Survey report by (KNBS, 2023), in 2022/2023, there were a total of 562,925 Students enrolled in public universities. With these new powered students, universities are at the fore front in adapting to the technological changes and incorporating technology into education to better deliver content to a learner. Tertiary institutions as places of knowledge advancement through teaching, scientific investigation and scholarly research are at the forefront in the promotion of equalization and empowering of PWD.

Statement of the problem

Digital inclusion is a term that refers to issues related to access to information communication technology and digital literacy (Himayah & Hurriah, 2022). People with disabilities as members of the society have equal rights to everyone. ICTs have had a significant impact on the lives of people with disabilities through enabling access to information and enhancing the scope of activities accessible to them both socially and economically in their communities (Busuulwa et al., 2020). As a vulnerable group, rights of people with disabilities need to be protected from discrimination, to enable successful integration into the society (Smith et al., 2022). The rise of information technologies has made digital literacy of all persons across all sectors of the economy a necessity (Himayah & Hurriah, 2022).

According to the Kenya Population and Housing Census (KPHC) 2019, there are approximately 918,270 persons with disabilities in the country, representing 2.2% of the population (Ministry of Public Service, 2021). As of 2021, approximately 29% of Kenyans were using the internet. Further records state that 22.6% of the population, aged of 15 years and above, use the internet, with 10.4% utilizing computers while 4.3% participating in e-commerce (Wambua, 2021). In addition, the Kenya National Bureau of Statistics (KNBS) census report, Kenya has over 20 million mobile users with one in five Kenyans having internet access (Sunday, 2020). People with disabilities make up the one in five Kenyans utilizing the internet as they account for 2.2% of the population. In 2019/2020, a total of 509,468 Students enrolled in public universities while in 2022/2023,

562,925 students were enrolled (KNBS, 2023). The figures show there is a 10% increase in the number of enrolled students with disabilities in public universities. As people with disabilities make up 2.2% of the Kenyans population, there is a rising need to ensure they are given equal participation in the digital community.

The government of Kenya has acknowledged the necessity of reducing the digital divide so as to meet the Sustainable Development Goals and its key pledge to 'leave no one behind'. According to the Economy survey done by (KNBS, 2023) there are a total of 602,133 persons registered by the NCPWD in Kenya as of 2022/2023. Total number of registered PWDs with that have visual, hearing and physical types of disabilities are 284,758 as of 2022/2023 according to the Economy survey by (KNBS, 2023). Tertiary institutions as places of knowledge advancement through teaching, scientific investigation and scholarly research are at the forefront in the promotion of equalization and empowering of PWD. The study reviews the digital inclusion measures that have been put in place by selected universities to promote technology accessibility for PWD. In summary, this study aims to examine digital inclusion and technological accessibility performance for persons with disabilities in tertiary institutions in Nairobi county.

Objectives of the study

This study was guided by a general objective and four specific objectives.

General objective of the study

This study aimed to examine the influence of digital inclusion practices on technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County.

Specific objectives of the study

The study was guided by the following specific objectives:

i. To determine how digital access influences technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County.
ii. To find out how digital usability influences technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County.
iii. To analyze the influence of ICT capacity building on technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County.
iv. To investigate how the regulatory framework influences technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County.

Research Questions

This research is answering the following questions.

i. How does digital access affect technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County?

ii. To what extent does digital usability influence technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County?
iii. What is the influence of ICT capacity building on technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County?
iv. How does the regulatory framework influence technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County?

Significance of the Study

This study analyzed digital inclusion practices and technology accessibility performance for PWD in Kenya. The study is of great significance to various stakeholders in the country that aim to ensure equality and inclusivity for PWD.

Ministry of Information, Communication and The Digital Economy (MOIC-DE)

This study is of great importance to the MOIC-DE. The MOIC-DE is mandated by the Presidential Executive Order No.1/2022 of October 2022 to formulate policies and laws that regulate the services and standards in the ICT, Telecommunication and Media industry. This study is important in reviewing effectiveness and performance of the various technology accessibility measures that have been put in place by the ministry.

ICT Authority

This study is of great importance to the ICT Authority (ICTA) as it is in line with their broad mandate to enforce ICT standards and supervise the use of electronic communication with ICTs in government for public service delivery. The study is important in assisting the ICTA to continue promoting digital literacy, innovation, capacity building and enterprise.

The National Council for People with Disabilities (NCPWD)

The NCPWD is a semi-autonomous government agency (SAGA), set up in 2004, by the Persons with Disabilities Act No. 14 of 2003 with the main goal of achieving equal opportunities for PWD. The NCPWD is responsible for promoting of normalization of disabilities through registration, employment placement and partnership with associations, institutions, and organizations that provide services to PWD. As technology is becoming a central part of our lives, the council is invested in ensuring the technology is accessible and the benefits can be enjoyed by PWDs. This study is important to highlight the rate of technology accessibility and digital inclusivity.

Communications Authority of Kenya (CA)

The CA is the regulatory authority for the communications sector in Kenya. The CA recognizes the need to make technology available for all in the society. To this effect, the CA has initiated various projects with the aim of providing ICT solutions to PWD and establishing institutions for PWD. This study is important to analyze technology accessibility performance in the country.

Scope of the study

The study focuses on the digital inclusion practices and technology accessibility performance for PWD in tertiary institutions in Nairobi county. The factors that are being analyzed include Digital access, Digital usability, ICT capacity building and the Regulatory Framework. This study is limited to PWD in tertiary institutions in Nairobi County. The categories of PWD in the tertiary institutions are limited to Students, Faculty members, Administrative staff and Support staff. The scope of disabilities is limited to individuals with blindness or visual impairments, auditory impairments and mobility or dexterity impairments.

Limitations of the Study

Technology accessibility for PWDs is at the forefront of all digital inclusion measures to ensure all persons have equal access to technology. Some participants were not willing to discuss the impact of digital inclusion programs due to fear of oversight. Not all respondents were willing to share their level of digital knowledge. The researcher had to modify the research instrument for some respondents to be able to participate. Respondents were assured that this study was meant for academic purposes.

LITERATURE REVIEW

Introduction

Over the last decade, there has been massive growth in the technological sectors with various innovation digital technologies being produced and adopted. With massive technologies innovations and advancements, many people have changed the way they interact and do their businesses. This has brought a need to ensure that technology can be used and is accessible by all so as to dimish the digital divide.

Theoretical Review

According to (Varpio et al., 2020), a theory is an abstract description of the relationship between concepts, supported by a large body of research, that aid in understanding a certain phenomenon. A theoretical framework shows how the main variables influence the phenomenon of interest, the

variables that should be measured and the relationship between the variables. This study is anchored by four theories as put forward by various scholars.

Technology Organization Environment Theory

The Technology-Organization-Environment (TOE) framework is a theoretical framework that explains how the interaction between technology, organization, and the external environment affects technology adoption and implementation in organizations. The framework was first introduced by (Tornatzky & Fleischer, 1990) and has since been used in numerous studies to understand technology adoption and implementation in various organizational settings. The TOE framework is a classical framework used to predict the organization's plan to adopt an information system (Jere & Ngidi, 2020). The TOE framework applies three key elements that influence the rate of adoption of technology; the technology element, the organization element and the environmental element.

The TOE framework places an emphasis on the importance of consideration of the interaction between the three elements and their influence on the rate of adoption and implementation of technology in organizations. The TOE framework can be utilized in the understanding of factors that influence the rate of adoption and implementation of various types of ICT infrastructure, including hardware, software and networking. The technological element consists of relative advantage, compatibility and complexity that influence adoption and implementation of ICT infrastructure in an organization. The organization element consists of top management support, financial resources and ICT knowledge that influence ICT adoption by an organization. The environment element consists of government, competition and stakeholders or external support that influence ICT adoption. This study is using the TOE framework to show how the technology, organization and environment elements influence digital inclusion practices and technology accessibility for PWD.

Technology Acceptance Model

The Technology Acceptance Model (TAM) was first developed by Fred Davis in 1986. It is a theoretical framework that describes or explains how individuals perceive and adopt new technological innovations. TAM details that an individual's intent to utilize a particular piece of technology is determined by two main factors: perceived usefulness and perceived ease of use (Kardanmoghaddam et al., 2022). Perceived usefulness refers to the extent at which a person believes that a particular technology improves their job performance or make their tasks easier to accomplish. Perceived ease of use refers to the degree to which an individual believes that using a particular technology should be simple and require minimum effort. According to (Salloum et al., 2019), perceived ease of use and perceived usefulness were found to be the most powerful determinants of users' intention to use a system. The two beliefs are subject to external and system-

related factors that influence a person's behavior and attitudinal intentions to utilize certain technology.

The Technology Acceptance Model (TAM) can be applied in the context of software accessibility to understand the factors that influence the adoption and use of accessible software by PWD. The TAM framework suggests that a person's intent to utilize accessible software is influenced by their perceived usefulness and perceived ease of use of the software. PWD may consider accessible software to be useful if it meets their daily technological needs and gives them the ability to effectively complete their tasks. They may also perceive software as easy to use if it is designed to be intuitive and user-friendly, with features that are specifically designed to accommodate their abilities. The TAM can provide valuable insights into the factors that influence the adoption and use of accessible software by PWD, and can help developers and designers to develop software that is more accessible and better meets the needs of all users. This should influence the rate of digital inclusion practices and technology accessibility among PWD.

Diffusion of Innovation Theory

Diffusion of innovation is the process through which a new technology or innovation is adopted by a population. The Diffusion of Innovation (DOI) theory was first put forth by Everett M. Rogers in 1962. DOI theory aims to expound on how and why and the speed at which an innovation or technology is spread in an environment (Iyamu, 2021). Diffusion is defined as the process through which an innovation is communicated through certain channels among member of a social system, over time. Innovation is defined an idea, object or practice that is seen as new by certain individual or the unit of adoption. Everett M. Rogers (Rogers, 2010), put forward 5 adopter categories based on the degree to which individuals adopt new ideas namely, innovators, early adopters, early majority, late majority and laggards.

Rate of adoption is the speed by which an innovation is adopted by members of a social system and is measured by the length of time required for certain percentage of members of the unit of adoption to adopt an innovation. According to (Rogers, 2010), the adoption of a new technology or innovation typically follows a bell curve with a small percentage of early adopter being the first to embrace the technology followed by a large percentage of early and late majority adopters and finally a smaller percentage of laggards. According to (Kardanmoghaddam et al., 2022), the DOI theory by Rogers is concerned with the processes of diffusion of innovation and acceptance of technology in a planned and systematic manner. The DOI theory suggests that innovators and early adopters are usually more willing to take risks and try our new technologies, while the majority and laggards are more cautious and require more convincing before adoption a new technology. This study aims to use the DOI theory to show its influence on ICT capacity building.

Institutional Theory

The Institutional Theory suggests that organizations are influenced by their social and cultural environment and that they must conform to the norms and values of the broader institutional context in which they operate. The theory states organizations and institutions are influenced by three main types of institutional pressures which are coercive pressures, mimetic pressures and normative pressures. Coercive pressures are pressures that come from laws, regulations, and other forms of formal control that are imposed by external factors such as governments or regulatory bodies. Mimetic pressure come from the aim to imitate or emulate other successful organizations in the same field or industry which can include imitating organizational structures, strategies, or practices. Normative pressures come from social and cultural norms and values and can include expectations around ethical behavior, social responsibility, and sustainability. The theory suggests that organizations must respond to these pressures in order to gain legitimacy and maintain support from key stakeholders such as customers, investors, and regulators.

According to (David et al., 2019), the institutional theory is usually used to explain the assimilation and spread of formal organization structures such as written policies and standard practices. In the context of Regulatory Framework, the Institutional Theory suggest that the regulatory framework is shaped by the cultural, political, and economic norms and values of the society in which it is implemented. The regulatory framework must be designed in a way that is seen as legitimate by key stakeholders, such as industry leaders, government officials, and consumers. This study aims to use the institutional theory to demonstrate an understanding of the broader social and cultural context in which the framework operates, and how the framework can be designed to gain legitimacy and support from key stakeholders.

Conceptual Framework

A conceptual framework can be stated as a diagrammatic representation of how underlying concepts in a study relate to one another (Mensah, 2020). A conceptual framework encompasses all aspects of the study. The study is investigating the cause-and-effect relationship of Digital access, Digital usability, ICT capacity building and Regulatory Framework on technology accessibility performance for people with disabilities.

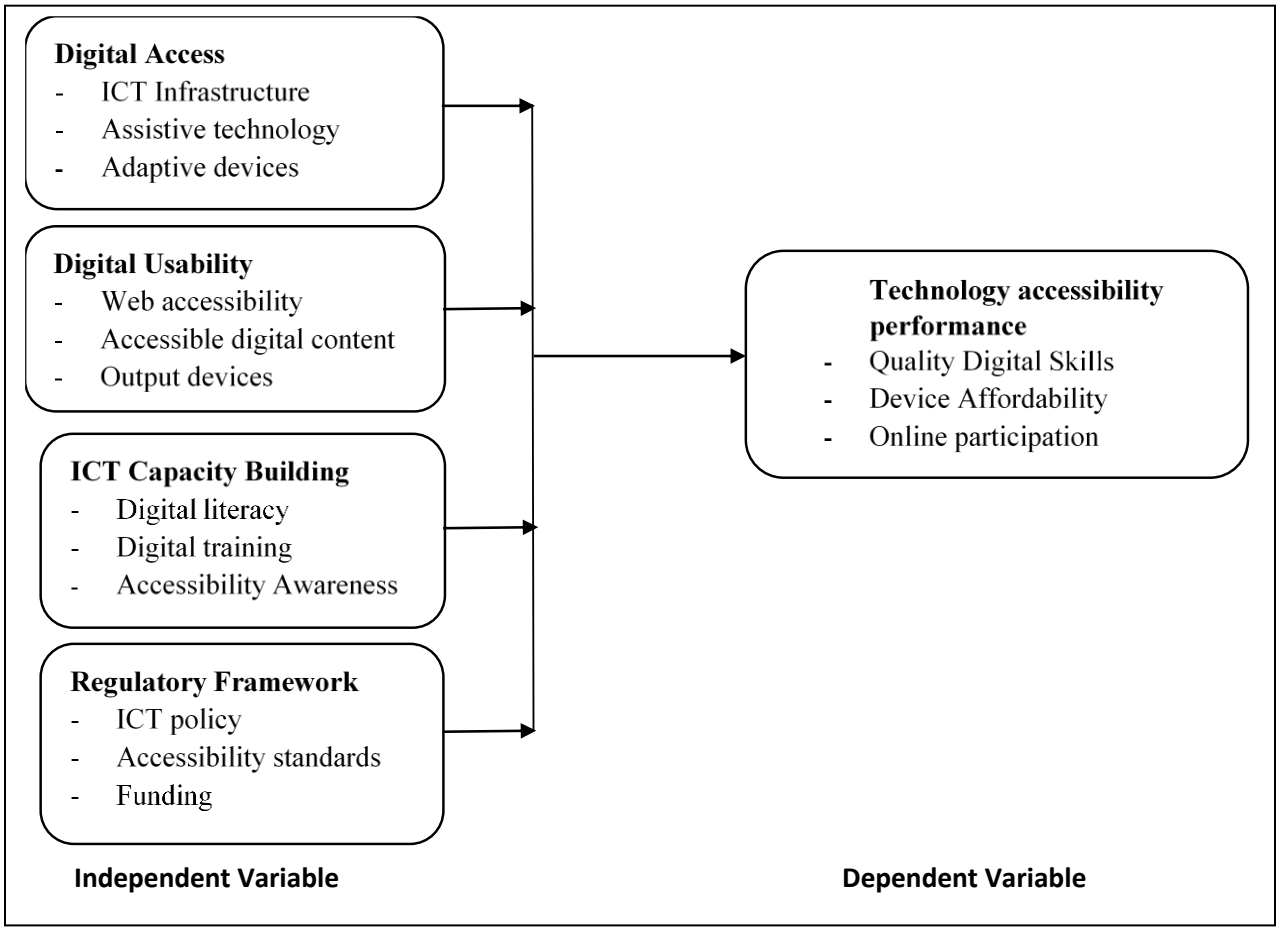

Figure 2.1 Conceptual Framework

Digital Access

To reduce the digital divide, the digital access needs to be ensured and maintained. Reliable internet connectivity has increased dependence digital devices resulting in a positive correlation between digital exclusion and social exclusion (Reisdorf & Rhinesmith, 2020). Investing in an extensive ICT infrastructure ensures internet access, access to digital devices and quality broadband access. The internet gives the general population connectivity and access to information and services for various needs (Sant'Ana et al., 2021). It is important to invest in infrastructure and technologies that make the internet more accessible and provide a channel to train and enhance digital skills to reduce the digital literacy gap (Ragnedda & Mutsvairo, 2018). The internet as a digital enabler should be readily available and accessible for all individuals in the society. Digital continuity is realized by ensuring effective engagement between the internet and ICT infrastructure (Aziz, 2020). Article 4 of the CRPD places importance on the availability of technological innovations that can be used by PWD at an affordable cost (Ullmann et al., 2018).

According to (EI et al., 2021), the key causes of digital inequality for PWD are web accessibility and hardware design. Hardware of various technological devices have not been modified for people with mobility disabilities (Scheerder et al., 2019). Making devices accessible increases the realization of reducing the digital divide. Software must be increasingly accessible to allow all persons with different capabilities to get equal benefits from technology (Goldberg et al., 2022). Software accessibility refers to the design and development of software that can be used by all persons with a wide range of abilities, including those with visual, hearing, and motor disabilities. For example; a person with a hand mobility impairment may not have the ability to use the same computer setup compared to someone without an impairment. Adaptive hardware such as alternative keyboard access, alternative pointing systems and on and off switches enable individuals with mobility or dexterity impairments to interact with computers.

Assistive technology enable PWD to live healthy, productive, independent, and dignified lives, and to participate in education, the economy and the society (WHO, 2023). Assistive technology works hand in hand with the environment. Accessibility of the environment is essential for assistive technology use, and accessibility measures often include elements of assistive technology (Borg et al., 2011). To this effect, the University Standards for Accreditation and Operations (CUE, 2014a), provisions the Accessibility of the services and facilities and services to all registered students. The environment should be made accessible for all persons. The environment in this paper refers to human-made structures, features, and facilities physically part of the lived environment such as floor space, ramp and lift access.

Digital Usability

For digital inclusion to be succeed, all individuals in the society public needs to be able to use digital technology. The government as a digital front runner migrating public services online by establishing e-government services has led to a massive increase of online content and services in the Kenyan internet landscape. A study by (Salvio, 2020) emphasizes that e-government services should be available in web applications that ensure access to all users in all regions, with adaptive and convenient assistive technologies that People with disabilities will be able to interact with. Websites and online applications need to be designed with accessibility in the forefront are of great benefit to PWD (Narasimhan, 2020). Accessible websites and web portals enable PWD to access information and participate and access online services giving them equal rights to all members of the society.

According to (EI et al., 2021), one of the main causes of digital inequality for people with disabilities is hardware design and web accessibility. To narrow down the digital divide among people with disabilities, various developments have been developed to enable PWD to have better access to web content (Salvio, 2020). WCAG which are the norms and standards that describe how

to make accessible content for people with focus on four principles of accessibility; perceivable, operable, understandable and robust(Chadli et al., 2021). The Web Accessibility Initiative (WAI) has created standards and resources need to aid in the understanding and implementation of accessibility. W3C WAI resources can be utilized in the development of applications, websites and many other digital innovations making them usable and accessible to all. User experience (UX) professionals who ensure web pages and digital services are up to regulatory standards and digitally accessibility is included in their designs are the key persons that promote digital inclusion (Inal et al., 2020).

Regardless of the type of disability, digital content and services should be accessible, meaning taking into consideration compatibility with assistive technologies, using enough contrast for visually impaired users, providing content that is understandable (Chadli et al., 2021). Output devices can be used to convert processed information from the computer into a human readable form (Rana, 2023). Speech generating devices are used to produce synthesized audio to aid individuals with hearing and speech impairments. Braille reader or the braille display assists individuals with vision impairments by converting computer output into braille by raising dots on a flat surface which can be read through touch. Various devices have not been adapted for people with mobility disabilities (Scheerder et al., 2019). For example; a person with a hand mobility impairment will not be able to use the same computer setup compared to someone without an impairment. Adaptive hardware such as alternative keyboard access, alternative pointing systems and on and off switches enable individuals with mobility or dexterity impairments to interact with computers.

ICT Capacity Building

As ICT becomes an essential part of both our work and daily lives, all people in the society including people with disabilities should have equal access and use of ICT. Inadequate ICT accessibility learning and training programs and integration of ICT accessibility courses in the curriculum limits the amount of knowledge and skills acquired by graduate students on how to make technology accessible (Khribi et al., 2022). Disability awareness training must be offered to individuals in the society to raise general awareness of disabilities, as well as awareness of the current technical solutions, such as e-accessibility and assistive technologies (Darvishy, 2018). To be able to use computers and the internet, digital skills are needed. Lack of digital skills is one of the biggest barriers of digital inclusion (EI et al., 2021). The society needs to inclusively have the skills needs to effectively utilize technology and promote access to information.

According to (EI et al., 2021), investing in digital literacy lessons in public areas, enabling continuous and all-day private access, identification and training of the members of the community and including targeted groups in the design of the programs has a drastic impact on reducing the digital divide. Digital literacy programs should emphasize on accessibility to enable inclusion of

the PWD to ensure that not a single individual is left behind. According to (Morte-Nadal & Esteban-Navarro, 2022) e-government systems need all citizens to have a certain level of digital skill. This brings the urgency to ensure the all citizen have the ability and the means to access digital government services. Promotion of digital skills and training, ensuring digital material is available and accessible fosters inclusion for PWD.

Regulatory Framework

For successful government digital transformation, digital technologies should be ingrained into the policy making and service delivery design process from the start (OECD, 2020). Digital inclusion must be prioritized by government when developing policies because the policies and regulation have a direct impact on social development and economic development (Sant'Ana et al., 2021). Governments should consult and work together organizations representing people with disabilities during the policy development process which is in line with article 4 of the CRPD (Ullmann et al., 2018). Involving the relevant parties ensures that all the needs of the affected individuals are taken into consideration and met. For example: Official web guidelines for the persons with visual and audio impairments are often ignored (Scheerder et al., 2019).

A study by (EI et al., 2021) argues that policymakers should prioritize increasing trust in the digital ecosystem and its tools, with greater articulation of the benefits of digitalization, provision of frequent updates of digital inclusion indicators, and developing locally recognized evaluation tools for learners to gauge their skill levels and continue in their digital learning journeys. Using various methods, policymakers are trying to address the various levels of the digital divide by emphasizing on the development of infrastructure to improve accessibility, by provisioning relevant services and content and by providing training and the required support to function in a digital society comfortably (Ragnedda & Mutsvairo, 2018). Availability of affordable and appropriate devices with connectivity and access to content, coupled with the appropriate skill to utilize them is key to attaining digital inclusion for PWD (Narasimhan, 2020).

The government, as the main stakeholder, needs to be at the fore front in implementation of programs and development of legislative policies that promote a digital inclusive environment. The Universities standards and guidelines (CUE, 2014b), state that a university should have a documented policy that include an ICT policy, disability policy, curriculum development policy and Internal Quality Assurance Policy. The guidelines also state the university should not promote on-discriminative practices against the equalization of persons with disabilities. The guidelines provision the Accessibility of the services and facilities and services to all registered students. The guidelines state the university shall provision equipment, facilities and communication links, enough in number size, scope, accessibility to reach all users and to attain the objectives of the online learning programs.

The United Nations Convention on the Rights of Persons with Disabilities (CRPD, 2022) requires countries to take effective measures to ensure that PWD have access to ICTs, including assistive technologies and are not overlooked. Universal service funds (USFs) are an effective mechanism that can be used to finance widespread measures to ensure ICT access to PWDs. A final draft of the Universal Service Fund of Kenya Operating manual (CA, 2022), has included ensuring the availability of communication services to Persons with Disabilities as one of its key objectives. The USF which attains its funding from levies on licensees, appropriations from Government as well as grants and donations, can be utilized to procure equipment and cater for installation fees and operational costs

Technology Accessibility

The Kenyan government aims to achieve the Sustainable development goals by ensuring digital inclusion of all persons in the society. To promote digital inclusivity for PWD, Assistive Technologies (AT) have been created and adopted to give access to various technological products and services. This is in line with the UNCRPD that aims to "promote, protect and ensure full and equal enjoyment of the human rights and fundamental freedoms by people with disabilities and respect for their dignity" (UNCRPD, 2022). ICT accessibility together with AT give PWD the ability to access various technological innovations. The availability and accessibility of ICT gives PWD the opportunity to access to education, develop skills through training and access employment opportunities, as well as participate in the various economic, cultural and social activities in the community (Omboto & Chege, 2021).

As more services, opportunities, resources, social relations, knowledge and information migrate to the digital space, use and access to ICTs has become essential for individuals to fully integrate into the digital society (Ragnedda & Mutsvairo, 2018). A study by (Busuulwa et al., 2020) addressing the availability of accessible mobile handsets for people with disabilities outlines that mobile handsets can be made accessible modifying the hardware design and operating system to incorporate various accessibility features and installing third party applications such as magnifiers and screens readers which aid user to navigate content. It is essential to ensure that PWD have access to digital training and quality digital technology so as to become productive members of society. To the same effect The Communication Authority of Kenya (CA) has put forward consumer protection guidelines for PWD that aim to guide service providers to observe certain standards when offering their services and provide critical information to consumers.

Empirical Review

This section details a review of the previous existing literature relating to the variables.

Digital Access on Technology Accessibility Performance

A study by (Aziz, 2020) details the importance of ensuring extensive ICT infrastructure is done so as to enable the government to reach all of its citizens. A study by (Botelho, 2021) states the shortcoming of adaptive hardware as the buttons and touch screens used by persons with motor or visual impairments can sometimes be inadequate especially for older persons with reduces dexterity. A study by (Haque et al., 2022) outlines the understanding of accessibility by various interviewees was consistent with the goals of accessibility design which are to maximize the number of users and increase the usability level of technology. (Haque et al., 2022) Further states how software and hardware are combined to provide accessibility giving examples of on-screen keyboards and voice and gesture recognition that are used as replacements for physical keyboards and mice. The conclusion of a study by (Omboto & Chege, 2021) recommends that the ICTA should work to ensure accessibility through provisioning devices and assistive technology to PWD and the strengthening of research and development to enable the growth of new ICT enabled solutions for PWD as well as including accessibility requirements in procurement policies.

Digital Usability on Technology Accessibility Performance

According to (Botelho, 2021) design and implementation challenges in applications and online environments such as websites and smart phone apps especially on platforms offering government services and educational institutions can be a big impediment to PWD receiving crucial services and benefits. A conclusion of a study by (Goldberg et al., 2022) states that engagement and contributions of all stakeholders should be considered before software design thereby provisioning software developers with the requirements and the resources needed to build accessible software and allow room for stakeholders to get accountability reports for the software development and the utilization of data. However, the study by (Goldberg et al., 2022) also considers that although literature proves that software accountability is an important consideration in software design, there is at present no universally approved definition of accountability in software.

The findings of a study by (Haque et al., 2022b) details that accessibility is not properly integrated into general software projects with 30% of the survey participants, which consisted of programmers and testers, having accessibility related work experience. (Haque et al., 2022a) states that accessibility in software design is often short-term and mostly focuses on UI design leading to many projects being refactored after release to incorporate accessibility solutions. (Haque et al., 2022b) argues that the lack of design standards and guidelines as an impediment for accessibility in software implementations especially for less experienced developers.

ICT Capacity Building on Technology Accessibility Performance

A study by (Botelho, 2021) outlines lack of training as a barrier to digital accessibility with PWD not having access to assistive training or guidance and in some occasions, having access to information or training that is incomplete or out of date.(Botelho, 2021) argues that there is still a

great deficit of trained persons that can be used for assistive technology referrals, assessment and selection as well as fitting of these devices, training, maintenance and repairs. According to a study by (Omboto & Chege, 2021), the availability of access and easy reach of ICTs enables PWD to have access to education, skills training and employment as well as the opportunity to contribute in the economic, social and cultural life of the society.(Aziz, 2020) argues that lack of training and hands-on experience leads to digital exclusion as digital technology requires certain competencies such as skills and literacy. A study by (Jumreornvong et al., 2020) highlights how developmental disabilities planning councils address the requirements of PWD through the various development projects and capacity building that promotes self-determination and inclusion. The results of a research by (Agrawal et al., 2022) concluded that government websites needed to improve accessibility and as a result of lack of accessibility awareness within government organizations, there was a lax in taking care of the needs of disabled people.

Regulatory Framework on Technology Accessibility Performance

A study by (Sant'Ana et al., 2021) states the need to ensure that regional and municipal governments have in place digital inclusion and accessibility policies, partnerships with various technology companies and ongoing investment in the local innovations. A study by (Alhassan & Adam, 2021),emphasizes the necessity for governments and the relevant authorities to put establish the required infrastructure to enable all persons to use ICTs. The study by (Alhassan & Adam, 2021) further highlights that the digital divide in developed countries is smaller compared to the developing nations due to extensive digital infrastructure, and improved access to ICTs by their citizens. A study by (Botelho, 2021) emphasizes that putting in place policies that safeguard the consumer and open standards in both hardware and software and on public procurement on accessibility requirements can have a trickle-down effect thereby increasing accessibility in the society. A study by(Bennett Gayle et al., 2021) states the importance of lawmakers working to reduce the digital divide by introducing legislation on affordable universal broadband to give internet access to all especially the vulnerable groups such as PWD.

Critique of Existing Literature Relevant to the study

Accessibility has become increasingly important as technology continues to evolve and offer innovative solutions. According to (Bennett Gayle et al., 2021), the digital divide remains an important issue as not everyone is able to enjoy the advantages to fast data and technology services and not all technology is equally accessible to all. The literature is very extensive and explains the factors to be considered to reduce the digital divide and increase technology accessibility. The literature is in line with the international web accessibility standards and policies that have laid in place by various regulatory bodies such as ITU, to harness technology. The literature places emphasis in ensuring digital technology is usable and accessible to all especially vulnerable groups such as PWD. The literature shows that there is great rise of PWD being left behind as technology continues to develop innovations and most services move to online platforms leading a great digital

divide. PWD are part of the population and they should be allowed to live with dignity and contribute to the society.

Summary of Literature Reviewed

The studies all highlight the importance of digital inclusion and ensuring that technology is accessible for all. It is important to ensure all persons are able to harness the benefits of technology so as ensure equal participation, opportunities and access to information. The studies highlight the importance of ensuring all the aspects of accessibility such as hardware and software need to modified so as to ensure they can be accessed by all. Hardware modification to enhance accessibility and software development accessibility standards work hand in hand in reducing the digital divide and increasing access to technology. Regulatory authorities have a big hand in putting in place policies and regulations that promote digital inclusion practices and technology accessibility in the country. Legislations promote technology accessibility and put in place device and software standards.

Research Gaps

Through the literature review, there are a few gaps that have been identified in digital inclusion practices and technology accessibility. Although technology accessibility and digital inclusion are important topics that need to be addressed, there are few studies analyzing and describing the rate of inclusion for PWD. Most researchers place great emphasize on the various measures to improve accessibility such as software, hardware and regulations that need to be actualized to ensure no one is left behind however, these studies don't outline the measures that are already in place. The studies don't involve the regional agency responsible for accessible ICTs in the research thus there is no clear indication of the measures being taken to enhance technology accessibility. There is a need to examine the current rate of digital access by PWD. The performance of the accessibility standards on various technological products and services needs to be evaluate to analyze the impact on digital inclusion.

RESEARCH METHODOLOGY

Introduction

This section details the techniques and methodologies are used in the study. This chapter presents details of the research design, target population, sample frame, sample size and sampling techniques, data collection instruments, data collection procedure, pilot testing, reliability of the instrument, validity of the instrument and the data presentation and analysis.

Research Design

The study employed a descriptive research design. Descriptive research design is useful in establishing a cause and effect between the variable as asserted by (Mugenda & Mugenda, 2003).

This approach offers a comprehensive exploration of the subject matter, allowing for the establishment of causal connections between various factors. By utilizing descriptive research, the study aimed to not only uncover patterns and trends, but also to identify potential cause-and-effect relationships among the variables under investigation. Through meticulous data collection and analysis, this methodology facilitated a deeper understanding of the phenomena being studied, thereby enhancing the overall validity and reliability of the research findings.

Furthermore, the descriptive research design adopted in this study is geared towards elucidating, explicating, and substantiating the outcomes obtained. This entails not only providing a detailed account of the observed phenomena but also delving into the underlying reasons and mechanisms driving these observations. By employing a descriptive approach, the study aims to offer a comprehensive and nuanced portrayal of the subject matter, shedding light on its intricacies and complexities. Through rigorous examination and validation of the study findings, this research endeavours to contribute valuable insights to the existing body of knowledge in the field, thereby advancing our understanding of the subject under investigation.

Target Population

The target population of the study consists of the 248,758 PWD registered by the NCPWD with visual, hearing and physical types of disabilities (KNBS, 2023). Target population was limited to Students, Faculty members, Administrative staff and Support staff, learning or working, in tertiary institutions in Nairobi County. The scope of the types of disabilities was limited to individuals with blindness or visual impairments, auditory impairments and mobility or dexterity impairments.

Sample Frame

A sample frame is a subset of individuals that have been selected as respondents for the study. Sampling aids the research in effectively administering the questionnaire to a reasonable sample group. The sample frame consists of Students, Faculty members, Administrative staff and Support staff in the tertiary institutions.

Sample Size and Sampling Technique

Sampling refers to the process of selecting a subgroup from the population who are participating in the study. A sample is a part of a population of individuals from whom the researcher obtains the relevant information for the study (Leavy, 2022). The size of the sample should be big enough for the researcher to use reasonable time and energy. According to (Fraenkel et al., 2019a), the recommended number of individuals for a descriptive study is less than 100. The tertiary institutions participating in the study have been selected using stratified sampling technique. The tertiary institutions were divided into sub-groups and a random sample was selected. The study used the non-probability sampling method, purposive sampling technique to justify the selection of the respondents from tertiary institutions. This technique is considered appropriate as it allows

the researcher to justify selection of the sample size based on logical, analytical and theoretical grounds (Berndt, 2020).

The sample size of this study has a ±10% sampling error with a confidence level of 90% and a margin of error of 10%.The sample size of this study has been determined using the formula below that was put forth by (Yamane, 1967).

$$n = \frac{N}{(1 + N(e)^2)}$$

Where:
n = the sample size
N = the total population
e = the margin of error
The sample size was be obtained by:

$$n = \frac{284758}{(1 + 284758\ (0.10)^2)}$$
$$n = 99.96489$$

The desired sample size comprises of 100 respondents.

Data Collection Instruments

Both secondary and primary data were used in the study. Secondary data was obtained from various information sources including people with disability reports, peer-reviewed journals, textbooks, newspapers, and other reports available related to the study topic. Questionnaires were used to collect primary data. The questionnaire items had both closed and open-ended questions. A five-point Likert scale table of closed questions consists of standardized questions aiming at obtaining respondents' sentiments, beliefs, and attitudes regarding the topic. Respondents indicated the extent to which they agreed or disagreed with each statement on a Likert scale table. The questionnaire was divided into two sections. Section one consisted of questions regarding respondents' background information while section two consisted of questions regarding the independent and dependent variables of the study.

Data Collection Procedure

The researcher attained an introduction letter that introduced the researcher to all the respondents. The questionnaires were administered to respondents both online and through the drop and pick method. Qualitative and quantitative data was collected through secondary sources of data such as websites, books, journal articles and academic publications.

Pilot Testing

This is the pilot test that was carried out before the researcher embarked on the research. The pilot study aimed to test the reliability and validity of the questionnaire. This assisted the researcher to identify any flaws or weaknesses in the questionnaires and allow for revisions to be done. The

pilot study was done two weeks before the real study using 10% of respondents from the sample size derived from the target population from randomly sampled tertiary institutions in Nairobi County. A sample of ten (10) questionnaires were subjected to the pilot study. (Creswell, et al 2020), the rule of thumb is that 10% of the sample should constitute a pilot test. The pilot study participants were excluded from the actual study.

Reliability of Instruments

Reliability refers to the random measurement of error that indicates the precision of the measuring instrument. (Fraenkel et al., 2019) defines reliability as the consistency of the results obtained and how consistent they are from one individual to another using an instrument. The pilot test was used to measure the reliability of the questionnaires. By testing the questionnaires, the researcher was able to reduce the measurement of error which included random error and bias. Random error can cause the data collected not to be precise and bias can cloud the researcher's judgment and cause the study to go in a specific direction. Cronbach's alpha coefficient was used to test for reliability

Validity of Instruments

Validity entails what and how well an instrument measure. According to (Fraenkel et al., 2019b), validity refers to the appropriateness, correctness, meaningfulness and usefulness of the conclusions drawn by a researcher from a study. Validity is especially important to consider when selecting a data collection instrument. The validity of the questionnaire was determined through questionnaire administration and discussion with 10 randomly sampled respondents from the randomly sampled tertiary institutions. The content of the questionnaire was reviewed according to their recommendations and specifications. Objectivity was observed throughout the duration of the study.

Data Analysis and Presentation

Both descriptive and inferential statistics were used to analyze the data and information that was collected in the study. The data from the questionnaires was encoded, and input into SPSS version 25 for analysis. Descriptive statistics was used to give a summary of the collected data in an organized manner and describe the relationship between the independent and the dependent variables. Frequency tables, which were generated using descriptive analysis, were used to create percentages and graphical representations of the data in the form of bar graphs, histograms, and pie charts. Descriptive statistics tools such as measures of central tendency (mean, median, and mode) and measures of variability (range and standard deviation) were used to analyze quantitative data collected.

Inferential statistics was used to draw conclusions from the sample data collected about the target population. Pearson correlation coefficient was used to measure the linear relationship between the independent and the dependent variables. The study data was analyzed by SPSS version 25

and the processing used multiple regression analysis models. According to (Fraenkel et al., 2019b) multiple regressions is used to examine the relationship between variables and is used to predict the value of one variable based on the value of the other. The following linear regression model was used to test the linear relationships between independent variables and the dependent variable:

$$Y = \beta 0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

Y = Technology accessibility performance (dependent variable)

$\beta 0$ = the constant or intercept

$\beta_1, \beta_2, \beta_3, \beta_4$ = the regression coefficient or slope of the independent variables X_1 to X_4 respectively

X_1 = Digital Access (Independent variable)

X_2= Digital usability (Independent variable)

X_3= ICT capacity building (Independent variable)

X_4= Regulatory Framework (Independent variable)

ε = the error term

FINDINGS AND DISCUSSIONS

Introduction

This chapter covers analysis of the data, presentations and discussions of the study findings. The researcher describes the analysis of the collected data from the samples based on the objectives of the study. Descriptive and inferential statistics have been used to analyze the data.

Response Rate

The study selected a sample of 100 respondents. The target population of the study consists of the 248,758 PWD registered by the NCPWD with visual, hearing and physical types of disabilities (KNBS, 2023). Target population was limited to Students, Faculty members, Administrative staff and Support staff, learning or working, in tertiary institutions in Nairobi County. The scope of the types of disabilities was limited to individuals with blindness or visual impairments, auditory impairments and mobility or dexterity impairments. All selected respondents were issued with questionnaires for data collection but the researcher received back only 93 questionnaires. The returned questionnaires formed a response rate of 93% as indicated in Table 4.1. According to Mugenda and Mugenda (2016), a response rate of 50% and above is good for analysis and reporting, that of 60% is sufficient while 70% and above is excellent. Therefore, since the response rate was above 70% it was considered to be excellent and was used for further analysis and reporting.

Table 4.1: Response Rate

Questionnaire	Frequency	Percent
Returned	93	93.0
Un-returned	7	7.0
Total	100	100.0

Reliability Analysis

Reliability is concerned with the research instrument's level of consistency and accuracy. Reliability refers to how much a measurement or an experiment produces the same results when repeated under similar conditions (Kennedy, 2022). The questionnaire's internal reliability was assessed using Cronbach's Alpha coefficient. A common method to measure scale reliability is the Alpha coefficient (Cronbach, 1951) which can be computed and communicated easily. The closer the correlation is to +1.0, the more reliable the results (Kennedy, 2022). The obtained overall Cronbach's Alpha value was above 0.8, indicating a high level of reliability, and thus affirming the suitability of the research instrument for this study. A reliable instrument should give consistent results (Fraenkel et al., 2019a). According to (Darren & Mallery, 2019), reliability is considered acceptable under certain thresholds. When Cronbach's Alpha exceeds 0.9, it is deemed excellent; a value above 0.8 is considered very good, and when it surpasses 0.7, it is rated as good.

Table 4.2: Overall reliability coefficients (Cronbach Alpha) of the independent variables

Variable	No. of Items	Cronbach Alpha Value
Digital Access	09	0.956
Digital usability	09	0.832
ICT Capacity Building	09	0.786
Regulatory Framework	09	0.871
Technology Accessibility Performance	09	0.826
AVERAGE	**09**	**0.854**

Demographic Information

This section presents the general information of study respondents. It includes their gender, length of service in the organizations, and level of education.

Gender of Respondents

The study sought to determine the gender distribution of the selected respondents and the findings obtained were as presented in Figure 4.1.

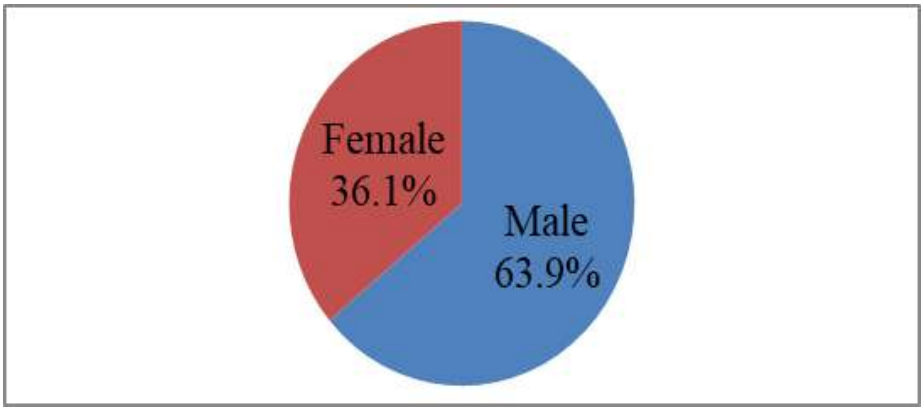

Figure 4.1: Gender of Respondents

From the findings presented in Figure 4.1, 63.9% of the respondents were male while 36.1% were female. Despite majority of the respondents being male, the study was gender inclusive since respondents of both genders were included in the study. These findings also suggest that majority of respondents were male.

Distribution of Age of Respondents by Age-Group

The study sought to establish the age groups of the respondents in the Study. Table 4.3. shows the distribution of the respondents according to their age groups.

Table 4.3.: Respondents age groups

Age of Respondents	Frequency	Percentage
20-30 Years	19	20
31 - 40 Years	16	17
41 - 50 Years	17	18
51 - 60 Years	21	23
Over 61 Years	20	22
Total	**93**	**100**

The findings in Table 4.3.2 indicate that majority of the respondents were between ages 20-30 years bracket representing a 20 %; 17% were between 31-40 years of age; 18.00.% were between 41-50 Years of age, 23% were between 51-60 Years of age and 22% were over 62 Years. Thus, the highest were 23 % while the least were 17%.

The age distribution of respondents played a crucial role in understanding the diversity of opinions and experiences related to digital inclusion practices and technology accessibility performance for

people with disabilities in tertiary institutions in Nairobi County. According to the study's findings presented in Table 4.3.2, the largest proportion of respondents fell within the 20-30 years age bracket, accounting for 20% of the total number of respondents. This finding resonates with previous research suggesting that younger generations exhibit greater comfort and proficiency with technology, often acting as early adopters and drivers of digital innovation (Smith et al., 2018).

Similarly, the second-largest segment of respondents belonged to the 51-60 years age group, representing 23% of the total. This relatively substantial percentage suggests that older adults continue to engage with technology despite potential barriers to access and usability. Prior studies have highlighted the importance of creating inclusive digital environments that accommodate diverse age groups, emphasizing the need for user-friendly interfaces, customizable features, and accessible design principles (Peek et al., 2014).

Conversely, the smallest proportions of respondents were those aged 31-40 years (17%) and over 61 years (22%). While these groups did not constitute the majority, their input remains invaluable in gaining a comprehensive understanding of digital inclusion practices and technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County.

Table 4.4: Distribution of respondents by their Length of service

Years worked	Frequency	Percentage
Less than 5 years	12	13
6-10 Years	17	18
11-15 Years	20	22
16-20 Years	16	17
21-25 Years	10	11
26-30 Years	12	13
31 and above Years	6	06
Total	**93**	**100**

Respondents Highest Level of Education

The study sought to determine the highest level of education held by the selected respondents. Figure 4.3 presents the findings obtained.

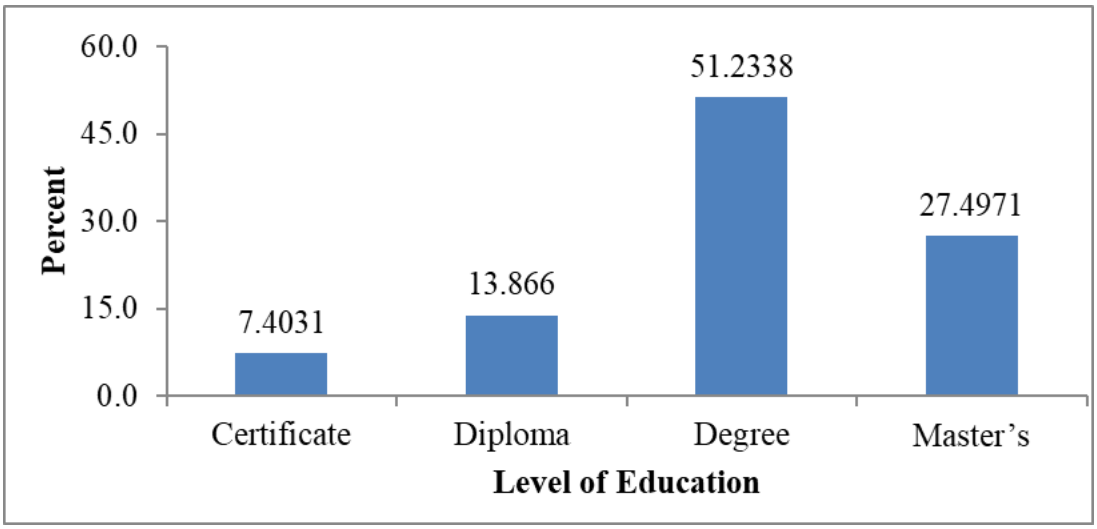

Figure 4.3: Respondents Highest Level of Education

From the findings presented in Figure 4.3, 51.2% of the respondents indicated that their highest level of education was degree, 27.5% had masters, 13.9% had diploma, while 7.4% had certificate.The findings on the highest level of education held by the selected respondents suggest that the majority of the participants possess degrees (51.2%). This indicates that the sample consists mainly of highly educated individuals who are presumably equipped with advanced skills and knowledge, which can positively affect the implementation and adoption of digital inclusion practices and technology accessibility for people with disabilities in tertiary institutions in Nairobi County.

Studies support the notion that higher levels of educational attainment can contribute to a better understanding of digital technologies, leading to increased acceptance and utilization of assistive technologies (Chung, 2019). In addition, educators with advanced degrees might be more inclined to incorporate universal design principles, which benefit all learners, including those with disabilities (McNeill & Rice, 2017).

Some research also indicates that individuals with higher education levels exhibit greater adaptability and willingness to learn new digital tools and software (Schaffhauser, 2015). This trait is particularly advantageous in the context of digital inclusion and technology accessibility, where keeping pace with rapidly changing technologies and adjusting to emerging trends are imperative.

Furthermore, the presence of educators holding master's degrees (27.5%) in the sample suggests that a substantial portion of the respondents possess specialized skillsets, possibly acquired through additional training or coursework focusing on digital pedagogies, instructional design, or assistive technology. This pool of talent brings valuable assets to the table, supporting the creation of equitable learning ecosystems for everyone regardless of ability. The findings on the respondents'

highest level of education indicate that the sample contains mainly highly educated individuals, predominantly holding degrees. This characteristic has far-reaching implications for the promotion and enhancement of digital inclusion practices and technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County

Descriptive Statistics of Study Variables

Digital Access

Respondents were asked to indicate the extent to which they agreed with statements about Digital Access on project performance, focusing on the building projects in Kenya. Table 4.3 presents the findings obtained.

Table 4.5: Descriptive Statistics on Digital Access

Statements	Mean	Std. Dev.
I have access to internet in my institution	3.982	1.370
My institution is expanding its network by installing wireless networks in more places	3.948	1.263
I have a high-speed reliable network connection in my institution	3.889	1.381
Assistive devices such voice recognition systems are readily available on most devices	3.863	1.326
I believe assistive technology enable people with disabilities to have equal access to technology.	3.777	1.275
My institution's computer lab has enough space for a wheelchair use.	3.738	1.320
Adaptive devices, such as voice recognition software and customized keyboards, greatly influence digital access for people with disabilities	3.698	1.331

From the findings in Table 4.3, the respondents agreed that I have access to internet in my institution (M=3.982, SD=1.37); that my institution is expanding its network by installing wireless networks in more places (M=3.948, SD=1.263); and I have a high-speed reliable network connection in my institution (M=3.889, SD=1.381). Respondents also agreed that Assistive devices such voice recognition systems are readily available on most devices (M=3.863, SD=1.326); I believe assistive technology enable people with disabilities to have equal access to technology. (M=3.777, SD=1.275); that my institution's computer lab has enough space for a wheelchair use. (M=3.738, SD=1.32); and that Adaptive devices, such as voice recognition

software and customized keyboards, greatly influence digital access for people with disabilities (M=3.698, SD=1.331).

In alignment with the United Nations Convention on the Rights of Persons with Disabilities (CRPD), Article 9 mandates states to take appropriate measures to ensure accessibility for persons with disabilities (United Nations, 2006). The CRPD calls for barrier-free environments, advocating for digital accessibility to information and communication technologies. The present study's findings echo this principle, with respondents expressing consensus on the availability of assistive devices ("Assistive devices such as voice recognition systems are readily available on most devices", M = 3.863, SD = 1.326) and adaptive devices ("Adaptive devices, such as voice recognition software and customized keyboards, greatly influence digital access for people with disabilities", M = 3.698, SD = 1.331). These results signal a growing consciousness and commitment to accommodate diverse learner needs in digital spaces. Moreover, the findings mirror past studies that advocate for the removal of architectural and environmental barriers hindering access to education for students with disabilities (Singleton & Ellison, 2013). Institutions appear to be heeding the call for improvement, as suggested by the affirmative response to "My institution's computer lab has enough space for a wheelchair use." (M = 3.738, SD = 1.32).

Access to technology for people with disabilities extends beyond merely being connected; rather, it requires an intentional focus on equity, equality, and justice to eliminate exclusionary practices and marginalization (Seale, 2006). Recognizing this obligation, respondents expressed favorable views on the belief that "assistive technology enables people with disabilities to have equal access to technology" (M = 3.777, SD = 1.275). This sentiment communicates that an inclusive mindset is gradually being cultivated within the studied institutions. Collectively, the findings from Table 4.3 convey that the investigated institutions have taken appreciable strides towards advancing digital accessibility and removing entry barriers for individuals with disabilities. Nevertheless, continued vigilance and persistent improvements in policy, infrastructure, and mindset are necessary to sustainably embed inclusivity within the fabric of tertiary institutions in Nairobi County.

Digital Usability

Respondents gave the extent to which they agreed with statements about the influence of Digital usability on Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county. Table 4.4 presents the findings obtained.

Table 4.6: Descriptive Statistics for Digital usability

Statements	Mean	Std. Dev.
Web platforms should be legally required to comply with web accessibility standards to promote digital inclusion practices for all	3.994	1.476
Web accessibility features, such as alt text for images, enhance the usability of websites	3.961	1.476
I believe that web developers should always include accessibility features to ensure digital content is usable by all people	3.955	1.546
Text and images in the websites I have accessed are large, recognizable and understandable.	3.915	1.343
I have visited a website or system that had an option to make content accessible.	3.856	1.525
I believe that my institution provides output devices that cater to various types of disabilities	3.836	1.22
I believe output made for specific disabilities play an important role in enabling all persons to be able to use technology	3.836	1.426

Based on the findings presented in Table 4.4, the respondents agreed that Web platforms should be legally required to comply with web accessibility standards to promote digital inclusion practices for all (M=3.994, SD=1.476); Web accessibility features, such as alt text for images, enhance the usability of websites (M=3.961, SD=1.476); and I believe that web developers should always include accessibility features to ensure digital content is usable by all people (M=3.955, SD=1.546). Respondents also agreed that Text and images in the websites I have accessed are large, recognizable and understandable. (M=3.915, SD=1.343); I have visited a website or system that had an option to make content accessible. (M=3.856, SD=1.525); I believe that my institution provides output devices that cater to various types of disabilities (M=3.836, SD=1.220); and that I believe output made for specific disabilities play an important role in enabling all persons to be able to use technology (M=3.836, SD=1.426).

The findings suggest a consensus among respondents regarding the significance of digital usability in fostering digital inclusion practices for all individuals. Specifically, the results indicate that web platforms should be mandated by law to adhere to web accessibility standards, web accessibility features such as alt text for images improve website usability, and web developers should consistently incorporate accessibility features to guarantee digital content accessibility for all people. Furthermore, respondents concur that text and images on websites should be clear, distinguishable, and comprehensible, and that institutions should offer output devices suitable for various forms of impairments. These findings resonate with prior research on digital inclusivity

and technological accessibility performance for individuals with disabilities in tertiary institutions in Nairobi County. Previous studies have highlighted the importance of technological accessibility and usability in creating an inclusive information and knowledge society where all individuals can participate equally, regardless of any physical limitations.

(Rao et al. 2015) emphasized the need to recognize diverse populations, including students with functional diversity or disabilities, when designing virtual learning environments. Similarly, (Boothe et al. 2018) underscored the value of accessibility and usability in enhancing learners' experiences with online courses. Edwards and Boyd (2018) noted that while accessibility, usability, and technology integration are considered essential practices, they are not always implemented in online courses. The findings highlight the critical role of digital usability in ensuring equal participation and opportunities for individuals with disabilities in digital educational environments. By incorporating accessibility features and adhering to web accessibility standards, web developers can create inclusive digital spaces that benefit all users

ICT Capacity Building

Respondents were asked to indicate the extent to which they agree with statements about the relationship between ICT Capacity Building practice and Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county. The findings obtained were as presented in Table 4.5.

Table 4.7: Descriptive Statistics for ICT Capacity Building

Statements	Mean	Std. Dev.
I use online platforms to learn new skills and get information	4.007	1.251
I am comfortable using a computer to access the internet and search for information on a browser.	3.994	1.343
I am confident in my ability to use digital devices e.g. a computer to access information and services online.	3.988	1.475
ICT trainers cover content relevant for people with disabilities	3.961	1.674
I have seen information in the media either video or printed addressing ICT accessibility for people with disabilities	3.83	1.441
I am satisfied with the current level of information and awareness that is available for accessibility for people with disabilities	3.817	1.142

Based on the findings presented in Table 4.5, the respondents agreed that I use online platforms to learn new skills and get information (M=4.007, SD=1.251); I am comfortable using a computer to access the internet and search for information on a browser. (M=3.994, SD=1.343); and that I am confident in my ability to use digital devices e.g. a computer to access information and services online. (M=3.988, SD=1.475). Respondents also agreed that ICT trainers cover content relevant

for people with disabilities (M=3.961, SD=1.674); I have seen information in the media either video or printed addressing ICT accessibility for people with disabilities (M=3.830, SD=1.441); and that I am satisfied with the current level of information and awareness that is available for accessibility for people with disabilities (M=3.817, SD=1.142).

These findings demonstrate a high degree of comfort and confidence among respondents in utilizing digital technologies for learning new skills and obtaining information, indicating a positive attitude towards digital capacity building. Moreover, there appears to be a general satisfaction with the availability of information and awareness related to ICT accessibility for people with disabilities. This suggests a growing recognition of the importance of digital inclusion practices within tertiary institutions in Nairobi County.

Previous studies have supported these findings, demonstrating that digital literacy plays a crucial role in promoting digital inclusion and reducing disparities between individuals with and without disabilities. For instance, (Lazar et al. 2015) conducted a study examining how different user groups interact with emerging assistive technologies, concluding that improving digital literacy is key to enhancing accessibility for those who experience difficulties navigating digital interfaces due to disability or age-related challenges.

Similarly, the work of (Kim & Lee 2019) revealed that providing proper training and resources could significantly increase the utilization rate of assistive technologies among disabled students, thereby narrowing the gap in ICT accessibility. Additionally, according to Chen et al. (2019), developing countries like Kenya may leverage mobile-based solutions to bridge the digital divide, particularly for disadvantaged communities. Mobile devices offer a cost-effective means of delivering accessible digital content, making it possible to reach larger audiences and foster greater equity in terms of ICT usage. Instructors and educators must adopt appropriate pedagogical strategies and employ user-friendly tools to facilitate effective communication and interaction in digital classrooms. As part of their professional development efforts, teachers should engage in continuous learning activities aimed at acquiring up-to-date competencies in teaching and managing digital classrooms (Kim & Lee, 2019).

Regulatory framework

Respondents gave their extent of agreement with statements on the relationship between Regulatory framework practices and Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County. Table 4.6 presents the findings obtained.

Table 4.8: Descriptive Statistics on Regulatory framework

Statements	Mean	Std. Dev.
I am aware that Kenya has a national ICT policy that regulates the ICT sector	3.975	1.169
I am aware that the national ICT policy addresses the ICT accessibility	3.902	1.235
My institution provides procedures for addressing ICT issues related to people with disabilities in the country.	3.902	1.235
I believe that people with disabilities have equal access to digital technologies and services due support through funding given by the Universal Service Fund (USF)	3.836	1.207
The decision-making and processes involved in the allocation of USF funds for digital inclusion programs are transparent and open to the public	3.83	1.3
The Universal Service Fund (USF) plays an important role promoting equal opportunities for people with disabilities	3.764	1.168

Based on the findings in Table 4.9, the respondents agreed that I am aware that Kenya has a national ICT policy that regulates the ICT sector (M=3.975, SD=1.169); I am aware that the national ICT policy addresses the ICT accessibility (M=3.902, SD=1.235); and that my institution provides procedures for addressing ICT issues related to people with disabilities in the country. (M=3.902, SD=1.235). Respondents further agreed that I believe that people with disabilities have equal access to digital technologies and services due support through funding given by the Universal Service Fund (USF) (M=3.836, SD=1.207); The decision-making and processes involved in the allocation of USF funds for digital inclusion programs are transparent and open to the public (M=3.830, SD=1.300); and that The Universal Service Fund (USF) plays an important role promoting equal opportunities for people with disabilities (M=3.764, SD=1.168).

According to (Bibiana et al., 2020) who investigated the effectiveness of implementing the Persons with Disabilities Act in Kenya, paying attention to ICT components to fully realize the potential benefits of the act reveales improvements in infrastructure, human resource management, and service delivery for the disabled community. (Onyango et al. 2017) analyzed the implementation status of the National Policy on ICT in Special Needs Education in Kenya. Their analysis demonstrated that although progress had been achieved in several areas, substantial gaps remained in integrating technology across schools serving children with special needs. To overcome these shortcomings, they recommended increased investment in teacher training, curriculum reform, and student assessment methods aligned with ICT requirements.

Another comparative case study by (Kaaria et al. 2019) examined the relationship between legal frameworks and ICT accessibility in Kenya and South Africa. While both nations have enacted progressive laws supporting ICT accessibility for persons with disabilities, inconsistent enforcement remains problematic. Hence, the authors suggested strengthening monitoring mechanisms and collaborations among stakeholders to achieve desired outcomes effectively. (Aduda & Matende 2016) explored the effects of ICT regulation and governance on marginalized groups, discovering that despite existing regulations, unequal representation persists. They posited that concerted efforts focusing on increasing awareness, advocacy, and collaboration would help rectify prevailing inequities.

Overall, previous studies validate the present findings but point out lingering concerns over consistent enforcement of regulations and equitable distribution of resources. Addressing these weaknesses will contribute significantly to bridging the digital divide experienced by people with disabilities in tertiary institutions in Nairobi County.

Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county

Respondents were asked to indicate the extent to which they agreed with various statements about Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county. Table 4.7 presents the findings obtained.

Table 4.9: Descriptive Statistics on Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County

Statements	Mean	Std. Dev.
People with disabilities are aware of their consumer rights and the various choices that are available to them	3.902	1.345
Procedures for reporting complaints by people with disabilities concerning telecommunications disputes have been given.	3.955	1.199
Complaints made by people with disabilities are handled in a special way depending on the disability.	3.961	1.149

From the findings presented in Table 4.7, the respondents agreed that Complaints made by people with disabilities are handled in a special way depending on the disability. (M=3.961, SD=1.149); Procedures for reporting complaints by people with disabilities concerning telecommunications disputes have been given. (M=3.955, SD=1.199); and that People with disabilities are aware of their consumer rights and the various choices that are available to them (M=3.902, SD=1.345).

Therefore, application of enterprise resource planning systems have helped the organization to improve in performance.

The findings from Table 4.7 suggest that people with disabilities in tertiary institutions in Nairobi County have a high level of awareness regarding their consumer rights and the different choices available to them when it comes to technology accessibility. Additionally, there are established procedures for reporting complaints related to telecommunication disputes, which are handled in a manner that takes into account the specific needs of individuals with disabilities. These results indicate that digital inclusion practices and technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County have improved. This is supported by several studies. For instance, research has shown that the implementation of enterprise resource planning (ERP) systems can significantly enhance organizational performance (Al-Hujran et al., 2018; Chang et al., 2010). Specifically, ERP systems can help organizations to better manage their resources, streamline processes, and improve communication and collaboration both internally and externally. In the context of technology accessibility for people with disabilities, ERP systems can facilitate the provision of customized services based on individual needs, thus promoting greater inclusivity.

Moreover, previous studies have highlighted the importance of establishing clear complaint handling procedures as a means of ensuring that the needs and concerns of people with disabilities are addressed appropriately (Choi & Lee, 2017; Oyedele et al., 2019). By providing specialized complaint handling procedures, organizations can demonstrate their commitment to addressing the unique challenges faced by individuals with disabilities and promote greater trust and confidence among this group. Finally, other researchers have emphasized the critical role of raising awareness about consumer rights and the availability of different choices in promoting digital inclusion (Borg & Galvin, 2018; Goggin & Newell, 2003). When people with disabilities are informed about their rights and the options available to them, they are more likely to advocate for themselves and demand appropriate accommodations. This, in turn, can lead to increased participation and engagement in digital spaces.

In summary, the findings presented in Table 4.7 suggest that digital inclusion practices and technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County have improved. Studies have shown that the implementation of ERP systems, establishment of clear complaint handling procedures, and raising awareness about consumer rights and choices can all contribute to enhancing organizational performance and promoting digital inclusion for people with disabilities.

Correlation Analysis

The study conducted Pearson moment correlation analysis. Using the correlation coefficient, the study tested whether interdependency existed between the independent variables and also whether there was any relationship between the dependent variable and independent variables and the direction of their relationship. The association was considered to be: small if ±0.1 <r< ±0.29; medium if ±0.3 <r< ±0.49; and strong if r> ±0.5. The correlation findings were as presented in Table 4.8.

Table 4.10: Correlation Analyses

		Performance	Digital Access	Digital usability	ICT Capacity Building	Regulatory framework
Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	93				
Digital Access	Pearson Correlation	.741**	1			
	Sig. (2-tailed)	.000				.
	N	93	93			
Digital usability	Pearson Correlation	.833**	.261	1		
	Sig. (2-tailed)	.023	.147			
	N	93	93	93		
ICT Capacity Building	Pearson Correlation	.730**	.325	.264	1	
	Sig. (2-tailed)	.001	.168	.078		
	N	93	93	93	93	
Regulatory framework	Pearson Correlation	.724**	.317	.336	.266	1
	Sig. (2-tailed)	.021	.123	.574	.278	
	N	93	93	93	93	93

**. Correlation is significant at the 0.05 level (1-tailed).

The findings show that Digital Access has a strong relationship with Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county (r=0.741). The findings also show that the relationship was significant since the p-value (0.000) was less than the selected level of significance (0.05). Digital usability is also seen to have a strong relationship with technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county (r=0.833). Also, the p-value (0.000) was less than the selected level of significant (0.05) an indication that the relationship between the two variables was significant. The findings further showed that ICT Capacity Building and technology accessibility performance for people with

disabilities in tertiary institutions in Nairobi county are strongly related (r=0.730). The relationship was also considered to be significant since the p-value (0.000) was less than the selected level of significance. Finally, Regulatory framework is seen to have a strong positive relationship with technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county (r=0.724). The p-value for the relationship (0.000) is seen to be less than the selected level of significance.

In addition, the relationship between the independent variable is small and insignificant. Since the relationship is small, it suggests that there is insignificant multi-collinearity between the variables and therefore regression findings won't be misleading. These findings show that Digital Access , Digital usability , ICT Capacity Building , and Project Regulatory framework have significant influence on technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county. To further understand the level of influence these variables have on Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county, the study computed regression analysis.

Regression Analysis

Multiple regressions were done to assess the relationship of digital inclusion practices and Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county. The findings of regression analysis were presented in three tables presented and discussed in subsections below.

Model Summary

The study used model summary in analyzing the variation of the dependent variable due to changes in the independent variables. The study analyzed the variation in Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county as a result of change in Regulatory framework , Digital usability , Digital Access and ICT Capacity Building

Table 4.11: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.950[a]	.902	.899	.05856

a. Predictors: (Constant), Regulatory framework , Digital usability , Digital Access , ICT Capacity Building

From the findings presented in Table 4.9, the value of adjusted R^2 was found to be 0.902 which implies that 90.2% variation in Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county can be attributed to changes in Regulatory framework , Digital usability ; Digital Access , and ICT Capacity Building . The remaining 9.8% suggests that there are other factors that affect technology accessibility performance for people with disabilities

in tertiary institutions in Nairobi county that were not included in the model. The relationship between the variables under investigation is shown by correlation coefficient which is denoted by R. From the results presented in Table 4.9, the variables were strongly and positively related as indicated by correlation coefficient value of 0.950.

Analysis of Variance

The study conducted analysis of variance with the aim of establishing whether that data used in the study was significant. The selected level of significance was 0.05 and the data was concluded to be suitable for analysis if the p-value was less than the selected significance level. The results were as presented in Table 4.10.

Table 4.12:ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.236	4	0.809	25.281	.000[b]
	Residual	0.306	89	0.003		
	Total	3.542	93			

a. Dependent Variable: Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county

b. Predictors: (Constant), Regulatory framework, Digital Usability, Digital Access, ICT Capacity Building .

The study found a significance value of 0.000 which was less than 0.05 at 95% confidence interval; which is an indication that the data is ideal for making conclusion. The F-critical value, obtained from the F-distribution tables, was less than F-calculated (2.461<25.281). This shows that Regulatory framework , Digital usability , Digital Access , and ICT Capacity Building significantly influence Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county.

Beta Coefficients of the Study Variables

The beta coefficients were used to illustrate the association between the variables using a model of the structure: $Y= \beta_0+ \beta_1X_1+\beta_2X_2+ \beta_3X_3+ \beta_4X_4+ \varepsilon$

Where Y= Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county; β_0 = regression constant; β_1, - β_4 = Coefficients; X_1 is Digital Access ; X_2 is Digital usability ; X_3 is ICT Capacity Building ; and X_4 is Regulatory framework .

Table 4.13: Beta Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	0.547	0.079		6.924	0.001
	Digital Access	0.298	0.071	0.282	4.197	0.029
	Digital usability	0.358	0.073	0.149	4.904	0.003
	ICT Capacity Building	0.301	0.077	0.303	3.909	0.02
	Regulatory framework	0.256	0.092	0.312	2.783	0.031

In view of the results in Table 4.11 above, regression equation extracted was as presented below.
$Y = 0.547 + 0.298 X_1 + 0.358 X_2 + 0.301 X_3 + 0.256 X_4 + 0.337 X_5 + \varepsilon$
The equation above reveals that holding the variables, Regulatory framework , Digital usability , Digital Access , and ICT Capacity Building constant, technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county was at a constant value of 0.547. Digital Access is seen to be statistically significant in explaining technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county as shown by (β = 0.298, P = 0.029). The influence is significant since the p-value (0.029) is less than the selected level of significance (0.05).

This indicates that Digital Access positively and significantly influenced Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county. Therefore, increasing Digital Access will lead to an increase in technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county by 0.298 units. The findings also showed that Digital usability is seen to be statistically significant in explaining Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county as shown by (β = 0.358, P = 0.003). The influence is significant since the p-value (0.003) is less than the selected level of significance (0.05). This indicates that Digital usability positively and significantly influence technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county. Therefore, increasing Digital usability will lead to an increase in technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county by 0.358 units.

ICT Capacity Building is also seen to be statistically significant in explaining Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county as shown by ($\beta = 0.301$, $P = 0.020$). The influence is significant since the p-value (0.020) is less than the selected level of significance (0.05). This indicates that ICT Capacity Building positively and significantly influence technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county. Therefore, improving ICT Capacity Building will lead to an increase in Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county by 0.301 units.

Lastly, the findings show that Regulatory framework is statistically significant in explaining technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county as shown by ($\beta = 0.256$, $P = 0.031$). The influence is significant since the p-value (0.031) is less than the selected level of significance (0.05). This indicates that Regulatory framework positively and significantly influence Technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county. Therefore, efficient Regulatory framework will lead to an increase in technology accessibility performance for people with disabilities in tertiary institutions in Nairobi county by 0.256 units.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the summary of the findings, conclusions and recommendations. Summary of the findings are presented based on the objectives of the study. The chapter also presents the conclusions based on the findings and finally recommendations made there-to.

Summary of the Study

The study analyzed data on digital inclusion practices and technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County. The response rate was above 70%, and reliability analysis showed high internal consistency. Most respondents were males aged between 20-30 years, with varying lengths of service and highest levels of education. Descriptive statistics indicate high mean scores for digital access, digital usability, ICT capacity building, regulatory framework, and technology accessibility performance. There is a strong correlation between these factors and technology accessibility performance. Regression analysis confirmed that digital access, digital usability, ICT capacity building, and regulatory framework significantly influence technology accessibility performance.

Overall, the findings suggest that digital inclusion practices and technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County have improved, thanks to factors such as enterprise resource planning systems, clear complaint handling

procedures, and raised awareness about consumer rights and choices. However, there is still room for improvement, especially considering other unidentified factors affecting technology accessibility performance. Further research can explore these factors to develop more targeted interventions.

Digital Access

The study focused on digital accessibility performance for people with disabilities in tertiary institutions in Nairobi County. Overall, the findings indicate a positive trend in digital accessibility, with respondents acknowledging the availability of assistive devices, adaptive features, and spacious computer labs for wheelchair users. The study revealed that digital accessibility features such as alt text for images and compliance with web accessibility standards enhance website usability. Participants also believed that web developers should include accessibility features to ensure digital content is usable by all people.

However, some areas require improvement, such as ensuring that text and images on websites are large, recognizable, and understandable. Although many respondents stated they knew about ICT accessibility policies, there is a need to raise awareness further and ensure transparency and fairness in allocating resources for digital inclusion programs. To summarize, the study highlights the importance of digital accessibility for people with disabilities in tertiary education settings. While there has been progress in implementing digital accessibility features, there is still room for improvement in areas such as website readability and resource allocation transparency. Enhancing digital accessibility leads to better usability, promotes inclusivity, and ensures equal opportunities for all learners, aligning with the UN's Convention on the Rights of Persons with Disabilities.

Digital usability

The study explores the relationship between digital usability and technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County. Key findings reveal that respondents consider web accessibility features, such as alt text for images and complying with web accessibility standards, to enhance website usability. Additionally, participants emphasize the importance of accessibility features to ensure digital content is usable by all people, irrespective of their abilities.

Most respondents acknowledge the presence of information in various formats, addressing ICT accessibility for people with disabilities, yet they report mixed feelings about their satisfaction with the current level of information and awareness available. Encouragingly, respondents feel that output devices provided by their institutions cater to various types of disabilities, contributing to an improved technology accessibility performance. The study reinforces the vital role of digital usability in facilitating technology accessibility performance for people with disabilities in tertiary education settings. Providing web accessibility features, complying with web accessibility

standards, and offering output devices tailored to meet individual needs are essential steps toward enhancing usability and promoting inclusivity in digital spaces.

Regulatory framework

The study investigates the relationship between the regulatory framework and technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County. Findings reveal that participants are mostly aware of Kenya's national ICT policy and its provisions for ICT accessibility. Yet, there is a perceived lack of clarity and consistency in the decision-making and allocation processes involving the Universal Service Fund (USF), designed to promote equal opportunities for people with disabilities.

While respondents appreciate the existence of procedures for addressing ICT issues related to people with disabilities, there is uncertainty around the efficiency and effectiveness of these measures. Nonetheless, participants believe that people with disabilities have equal access to digital technologies and services due to support through funding given by the USF, though the transparency and openness of the fund's administration remain questionable. The study sheds light on the importance of a robust and well-implemented regulatory framework to ensure adequate technology accessibility performance for people with disabilities in tertiary education settings. Improving decision-making and allocation processes related to the Universal Service Fund and fostering transparency and openness in administering the program can significantly contribute to enhancing technology accessibility performance.

ICT Capacity Building

The study focuses on the role of ICT capacity building in enhancing technology accessibility performance for people with disabilities in tertiary institutions in Nairobi County. Results indicate that participants generally have a positive attitude toward using online platforms to learn new skills and acquire information. Most respondents feel comfortable using computers and digital devices to access online resources, reflecting a solid foundation of basic ICT skills. However, there seems to be room for improvement in ICT capacity building specifically geared toward people with disabilities. Less than half of the respondents acknowledged seeing information in the media addressing ICT accessibility for people with disabilities, and few felt completely satisfied with the current level of information and awareness available. The study highlights the importance of investing in targeted ICT capacity building programs for people with disabilities in tertiary education settings. Strengthening ICT skills among this demographic can empower them to utilize technology more independently and efficiently, ultimately improving technology accessibility performance.

Conclusions

Based on our examination of digital access, digital usability, regulatory framework, and ICT capacity building in tertiary institutions in Nairobi County, several key conclusions can be drawn.Firstly, regarding digital access, it appears that efforts to ensure equal access to digital technologies and services for people with disabilities are yielding positive results. However, continuous evaluation and improvement of accessibility features and digital platforms are necessary to keep pace with technological advancements.

Secondly, in terms of digital usability, respondents showed a satisfactory understanding and appreciation of digital usability concepts. Ongoing emphasis on digital usability best practices is encouraged, as usability significantly impacts the overall user experience.Thirdly, concerning the regulatory framework, while participants were generally familiar with Kenya's national ICT policy and provisions for ICT accessibility, there is a perceived need for more clarity and consistency in decision-making related to the Universal Service Fund. Greater transparency in administering the fund could enhance technology accessibility for people with disabilities.

Overall, this study contributes to advancing digital inclusion and technology accessibility for people with disabilities in tertiary education settings. Sustained efforts from policymakers, educators, and administrators are crucial for realizing truly inclusive digital environments. Future research could focus on innovative methods to integrate digital technologies seamlessly, refine regulatory frameworks, and devise novel strategies for ICT capacity building tailored to people with disabilities, ultimately unlocking the transformative power of digital technologies for everyone.

Recommendations

This study delved into the state of digital accessibility performance for people with disabilities in tertiary education institutions located in Nairobi County. Four main aspects—digital access, digital usability, regulatory framework, and ICT capacity building—formed the basis of the investigation. The primary objective was to shed light on strengths, weaknesses, and opportunities for improvement in each area, thereby informing future strategies to enhance digital inclusivity.

Findings revealed that participants enjoyed reasonable access to digital technologies and appreciated the usefulness of accessibility features. However, concerns surrounding digital usability emerged, necessitating heightened awareness and emphasis on web accessibility standards. Meanwhile, the regulatory framework appeared moderately supportive of technology accessibility performance, requiring consistent oversight and enforcement. Lastly, ICT capacity building seemed somewhat lacking, pointing to a need for targeted initiatives aimed at imparting digital skills to people with disabilities.

Considering these insights, several recommendations emerge to fortify digital accessibility performance for people with disabilities pursuing tertiary education. First, fostering cross-institutional collaboration can yield dividends by driving innovations in digital accessibility and encouraging shared best practices. Second, regularly updating digital platforms and technologies keeps stride with evolving tech landscapes, maintaining optimal accessibility features and functionality. Third, intensifying awareness campaigns centered on web accessibility guidelines helps garner broader support and understanding amongst pertinent stakeholders. Fourth, introducing mandatory accessibility checks during quality assurance processes safeguards against glitches and maintains high digital accessibility standards. Fifth, gathering regular feedback from people with disabilities allows for iterative improvements in line with real-world demands and expectations.

Ultimately, diligent application of these recommendations can elevate the digital accessibility landscape for people with disabilities, engendering limitless possibilities for academic achievement and personal development. By placing digital inclusivity at the forefront, tertiary education providers can catalyze meaningful transformation, propelling countless lives forward along pathways of prosperity and self-actualization.

Areas for Further Research

This study examined digital accessibility performance for people with disabilities attending tertiary education institutions in Nairobi County, focusing on digital access, digital usability, regulatory framework, and ICT capacity building. The study suggest the following areas for further research:

i. A similar study should be conducted to ascertain the barriers impending exclusive digital inclusivity for persons with disabilities in tertiary institutions in Kenya.
ii. A study should be conducted to ascertain the influence digital literacy and awareness programs on digital inclusion for people with disabilities in tertiary institutions in Kenya
iii. A study should be conducted on the relationship between the regulatory framework and digital inclusion practices in Kenya.

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