**Assessing the implication of Information Technologies’ Accessibility for Children with Disabilities in Zanzibar, Tanzania: Need and Challenges**

**ABSTRACT**

**Aims:** The purpose of this paper is to analyze the hindering factors on the ability of children with disabilities to access digital services in Zanzibar.

**Background**: The adoption of digital technologies and services by the government, private sector and citizens has been identified as a fundamental element of economic development that contributes to economic growth and facilitates job opportunities. The advancements in science and technology and the increase of digital platforms have impacts on the daily lives of children with disabilities and their families.

**Study Design:** This study employed a cross-sectional design.

**Place and Duration of the study:** The study was conducted in Zanzibar from April 2024 to October 2024.

**Methodology:** Random sampling and purposive sampling were used to select 72 respondents in the study area with an age range from 18 to 50 years. In this paper, primary and secondary data were employed. Both qualitative and quantitative data were collected. Quantitative information was analyzed by using SPSS and Microsoft Excel and Content Analysis was used to analyze qualitative data.

**Results:** The results from this study show that 38% of the respondents agreed that lack of assistive devices is one of the hindering factors in the study area, 31% strongly agreed on the financial factors, 37% strongly agreed on the environmental factors, and 37% of the respondents strongly agreed on the lack of knowledge on digital technologies and 37% agreed on the poor assistance from parents or guardians as one of the hindering factors on the ability of children with disabilities in accessing digital services in the study area.

**Conclusion:** The study concluded that there is a presence of hindering factors in the study area. So, there is a need to address those factors in order to ensure the ability of children with disabilities to access digital services in the study area.

***Keywords:*** *Children with disabilities, Digital services, Hindering factors and Ability*

1. **INTRODUCTION**

“Children with disabilities are a highly diverse population group. They include children who were born with a genetic condition that affects their physical, mental or social development. Also includes the children, who sustained a serious injury, nutritional deficiency or infection that contributed to long-term functional difficulties. On the other side, children with disabilities also include those who were exposed to environmental toxins that resulted in developmental delays. The findings show that, of the 240 million children globally with disabilities, nearly 29 million children with disabilities live in Eastern and Southern Africa. Each of them like every child in the world has the right to be nurtured and supported through responsive care and education, to receive adequate nutrition and social protection, and to enjoy play and leisure time” (UNICEF, 2023).

In this digital era, children with disabilities are going through many difficulties. Many services nowadays are in digital forms. The advancements in science and technology and the increase of digital platforms have impacts on the daily lives of children with disabilities and their families. Buthelezi et al (2024) described that, with the world moving to digitization, people with disabilities including children are increasingly being left behind in technology adoption and important decisions regarding the use of technologies.

“On the other side, the adoption of digital technologies and services by the government, private sector and citizens has been identified as a fundamental element of economic development that contributes to economic growth and facilitates job opportunities. Based on the facts from children with disabilities, it has been found that many people with disabilities (PwD) do not use the internet and related technologies because of varying barriers that make the technology unfriendly to the many kinds of disabilities” (Lazar and Jaeger, 2011).

In the movement to digital technologies, it is estimated that over 1 billion people around the world need some form of assistive technology, yet 90% of these people do not have the assistive technology they need. Statistics show that, in 2020 in low and middle-income countries, there were an estimated 850 million people in need of glasses, 54 million in need of hearing aids, 60 million in need of wheelchairs and 35 million in need of prostheses. Based on the needs of assistive technologies and other hindering factors, the rights of children with disabilities, as described in the Convention on the Rights of the Child and the CRPD, demand a systemic approach to the provision of access to assistive technologies (UNICEF, 2022).

In Tanzania, 2.3% of children have disabilities (UNICEF, 2021). “Despite having a number of people with disabilities, Tanzania has recently seen growth in the digital communication sector. The number of internet users has significantly grown to more than 30 million users, in 2020, according to the Country’s Telecommunication Authority (TCRA). Reflecting on the hindering factors among children with disabilities in accessing digital services in most African countries, one of the key points that indicate a lack of inclusiveness in the digital sector for people with disabilities includes the absence of telecommunication services that are inclusive to the people with disabilities as well as the high cost of their communication equipment and technologies” (Henrick, 2021).

“The exclusion of persons with disabilities from adequate access to information and communication technology (ICT) can significantly decrease their quality of life” (Ferreras et al., 2017). “ICT has revolutionized the lives of persons with disabilities globally through opportunities for improved social inclusion. Technology enables persons with disabilities to access information, media, education, employment, and ICT-related assistive technologies” (Othman et al., 2023). “ICT can be a powerful tool for improving the quality of life for persons with disabilities and enhancing their inclusion and social engagement. Indeed, as noted by a United Nations report, “For most people, technology makes things easier. For persons with disabilities, technology makes things possible.” That notwithstanding, persons with disabilities in Tanzania continue to face several challenges in access to information use of the internet and physical access to public services and premises. Unimplemented laws and policies, the low spread and high cost of assistive technology, the lack of research and disaggregated data, and the insufficient government support for disability rights programmes present the key challenges that must be addressed” (CIPESA, 2021). “Students with impairment can participate and engage in learning using ICT solutions, including assistive technology, text-to-speech software, and digital learning platforms” (Oji et al. 2024).

Based on the study area, Zanzibar is undergoing a digital transformation that is dramatically improving the government’s planning and budgeting processes, transparency and service delivery to the citizens. In a quick analysis, the development is a result of the introduction of the government financial systems, which among others have helped to fast-track track execution of various roles and services’ deliveries (Daily News, 2024). In this transformation, children with disabilities need to be included. The inclusion of children with disabilities in digital transformation is very important because it will help them learn many things related to digital world and simplify their ability to access digital services easily.

1. **METHODOLOGY**

The collection of information to develop this paper was done in Zanzibar. Both, random and purposive sampling were employed to select respondents in the study area. The sample size of the study was 72 respondents with an age range from 18 to 50 years. Primary data was collected by using questionnaires and interviews. Secondary data were obtained from published and non-published research, government and nongovernmental reports, journal articles, media and social media information. Descriptive analysis was done by using Statistical Package for Social Sciences (SPSS) to analyze quantitative data and content analysis was employed in analyzing qualitative information obtained from the study.

1. **RESULTS AND DISCUSSION**

The paper is based on the major results on the hindering factors on the ability of children with disabilities to access digital services namely, lack of assistive devices, financial factors, environmental factors, lack of knowledge on digital technologies and poor assistance from parents or guardians. The statements were measured by using open and close-ended questions and a five-point Likert scale whose results are as follows.

**3.1 Lack of Assistive Devices**

The respondents were asked if the lack of assistive devices is one of the hindering factors on the ability of children with disabilities to access digital services. The results from Table 1 indicate that 38% of the respondents agreed that lack of assistive devices is one of the hindering factors on the ability of children with disabilities to access digital services in the study area, 28% strongly agreed, 22% were neutral and 12% of the respondents disagreed that lack of assistive devices is not one of the hindering factors among children with disabilities in accessing digital services in Zanzibar. This implies that most of the children with disabilities are capable of accessing digital services but they fail to do so, due to the lack of supportive devices. During the interview one of the respondents said,

*“It does not mean that children with disabilities do not have the ability to access digital services. Most of them are from poor families so the challenge they face is a lack of assistive devices. I believe that, if they will get the assistive devices, they will access the digital services properly”.*

| **Table 1: Lack of Assistive Devices**  |
| --- |
|  | **Frequency** | **Percent** |
| Strongly Agree | 20 | 28 |
| Agree | 27 | 38 |
| Neutral | 16 | 22 |
| Disagree | 9 | 12 |
| **Total** | **72** | **100** |

Based on the findings, the United Nations Convention on the Rights for People with Disabilities (UNCRPD) stipulates access to assistive products (AP) as important. Following the UNCRPD, the World Health Organization (WHO) launched a program called Global Cooperation on Assistive Technology (GATE) to support countries in developing national policy programs, training packages for professionals, and service delivery models around assistive technology, all to improve access and use of AP for those in need including children with disabilities (WHO, 2014).

Other findings indicate that significant challenges faced by pupils with albinism in the learning process included the absence of assistive devices. However, the study identified several ICTs equipment, such as Digital Tablets, Optical Character Recognition (OCR), Screen readers, Braille translation software, Braille writing equipment, Closed-Circuit Television (CCTV), Braille embossers, Scanners, as practical assistive devices that could improve the learning environment for pupils with albinism. These devices have the potential to enhance their learning capabilities and facilitate their academic performance, bringing them on par with their non-albino peers (Mwangakala *et al*, 2023).

On the other side, it has been found that assistive devices, exercise therapy and supplements were the most commonly reported needs among children with disabilities. Similar findings have been shown in Thailand, where most children with physical disabilities need assistive devices for mobility and communication. These assistive devices are fundamental for helping with mobility, functioning, independence and inclusion in society. However, assistive devices must be used with appropriate therapies (Lersilp *et al*, 2018).

In general, assistive devices are very important for children with disabilities. Lack of assistive devices affects the maximum number of children with disabilities in performing many things in their daily activities. The availability of these devices helps these children not only to access digital services but also to perform other duties effectively.

**3.2 Financial Factors**

The respondents were asked if financial factors are one of the hindering factors on the ability of children with disabilities to access digital services. The findings from Table 2 revealed that 31% of the respondents strongly agreed that financial factors are one of the hindering factors on the ability of children with disabilities to access digital services in the study area, while 25% agreed, 7% were neutral, 22% disagreed and 15% of the respondents strongly disagreed. The findings imply that the majority of the respondents strongly agreed that the ability of children with disabilities to access digital services is hindered mostly by financial factors. Many children with disabilities fail to access digital services because of insufficient money to buy modern digital devices and paying charges for financial services. This was supported by one of the parents with a child with disabilities by saying,

*“Sometimes you want to make sure that, the children with disabilities are accessing the digital services by using smartphones, computers, tablets and other digital devices, but you came to realize that, behind the technology, there are other many challenges that need money and bad enough you do not have enough money to settle all the bills”.*

| **Table 2: Financial Factors**  |
| --- |
|  | **Frequency** | **Percent** |
| Strongly agree | 22 | 31 |
| Agree | 18 | 25 |
| Neutral | 5 | 7 |
| Disagree | 16 | 22 |
| Strongly Disagree | 11 | 15 |
| **Total** | **72** | **100** |

In relation to the findings, Darvishy *et al* (2019) argued that research suggests that individuals with disabilities have lower overall internet access than the general population. One contributing factor to this is that people with disabilities have lower employment rates and average incomes, making it more probable that the costs of internet subscriptions and technological devices will be prohibitive for them. Based on this argument it is true that most children with disabilities lack access to digital services due to financial constraints that sometimes have been contributed by the poverty line of their family hoods.

Similarly, Stoevska (2022) observed that there is an extremely low labour force participation rate among people with disability. Globally, 7 in 10 people with disabilities are inactive means, not employed or unemployed, compared to 4 in 10 people without disabilities. In addition, individuals and families with disabilities can face significant financial challenges, sometimes contributing to a cycle of poverty because of the lack of essential resources. From this point of view, it is true that children with disabilities are having a hard time accessing digital services simply because of financial factors.

On top of that, other scholars argued that costs related to the acquisition of modern assistive and adaptive technology as well as mobile devices are an important issue for people with disabilities (Macdonald and Clayton, 2013). On the other hand, it has been found that the financial costs for mainstream and specialized advanced technology represent a barrier that keeps people with disabilities from fully engaging in and profiting from technological developments (Harris, 2010).

**3.3 Environmental Factors**

The respondents were asked if environmental factors are one of the hindering factors on the ability of children with disabilities to access digital services. The results from Table 3 indicate that the majority of the respondents 37% strongly agreed, 24% agreed, 21% were neutral, 8% disagreed and 10% of the respondents strongly disagreed that environmental factors as one of the hindering factors on the ability of children with disabilities in accessing digital services in Zanzibar. This implies that environmental factors can be one of the barriers to children with disabilities accessing digital services. So, there is a need to ensure that children with disabilities are in a safe and good environment that can be friendly for them.

To cement on the findings, one of the respondents said,

*“The performance of our children in many activities depends more on environmental factors. Based on that, children with disabilities need a friendly environment so as they can access digital services smoothly”.*

| **Table 3: Environmental Factors** |
| --- |
|  | **Frequency** | **Per cent** |
| Strongly Agree | 27 | 37 |
| Agree | 17 | 24 |
| Neutral | 15 | 21 |
| Disagree | 6 | 8 |
| Strongly Disagree | 7 | 10 |
| **Total** | **72** | **100** |

On the other wing, the empirical studies of the participation of children with disabilities, have shown environmental factors can and often do impede a child’s social and activity participation at home, school, and in the community. Characteristics such as temperature, terrain, lighting, noise, crowding, design and accessibility of home, school, and community environments can pose significant barriers to participation for children with physical disabilities (Welsh *et al*, 2006).

In addition, at the community level, fewer municipal resources and public services such as inclusive schools, transportation, recreation programs and programs with adaptive equipment have been shown to impede the community participation of children with physical disabilities (Mihaylov *et al*, 2004). Parents of children with disabilities rated environmental factors as barriers more often than parents of children without disabilities (Bedell *et al*, 2013).

**3.4 Lack of Knowledge of Digital Technologies**

In this part, the respondents were asked if lack of knowledge of digital technology is one of the hindering factors on the ability of children with disabilities to access digital services. The results from Table 4 show that, 37% of the respondents strongly agreed, 32% agreed, 15% were neutral, 10% disagreed and 6% of the respondents strongly disagreed that lack of knowledge of digital technologies is one of the hindering factors on the ability of children with disabilities in accessing digital services in the study area. The findings imply that most of the children in the study area fail to access digital services due to the fact that, they lack knowledge of digital technologies. This has been witnessed by one of the respondents said,

“*One of the great challenges affecting the ability of children with disabilities in accessing digital services not only in Zanzibar but also in other parts of Tanzania is lack of digital knowledge. Most of the children with disabilities are from poor families so the families cannot afford to send the children with disabilities to special schools where they can learn different things, especially digital issues. As we know now we're in the era of science and technology digital knowledge is very important for children with disabilities”.*

| **Table 4: Lack of Knowledge on Digital Technologies** |
| --- |
|  | **Frequency** | **Percent** |
| Strongly Agree | 27 | 37 |
| Agree | 23 | 32 |
| Neutral | 11 | 15 |
| Disagree | 7 | 10 |
| Strongly Disagree | 4 | 6 |
| **Total** | **72** | **100** |

In relation to the findings, Buthelezi et al (2024) argued that the Global Education Monitoring report from 2016 found that people with disabilities had a much higher risk of not possessing even the most basic literacy skills. According to this report, in Uganda in 2011, almost 60% of young people who had not been recognized as having any kind of disability were literate. Contrastingly, only 47% of young people who had either a physical or hearing impairment or 38% of young people who had a mental impairment were found to be literate. The report further states in the United Republic of Tanzania, a survey found that the literacy rate for people with a disability was 52%, compared with 75% for people without a disability (Global Education Report Team, 2013).

On the other side, the study conducted by Juma and Ntulo (2024) on the availability and use of assistive technologies among pupils with hearing and visual impairments in Zanzibar, revealed that lack of awareness about Assistive Technologies (AT) availability 22.8 %, insufficient knowledge on how to use AT 22.8%, negative attitude towards AT 24.8% and difficulty in using the devices 15.8% are the challenges facing these pupils in the study area. In addition, Buthelezi et al. (2024) found that most People with Disabilities (PwD) have not received training on how to use electronic devices. This was confirmed by 85% of PwD that they have never received any formal training on how to use electronic devices. Only a handful (15%) of the respondents have been trained Turning to the use of digital media, a lack of access to digital technologies is an obstacle for many people with disabilities (Macdonald and Clayton 2013).

**3.5 Poor Assistance from Parents or Guardians**

The respondents were asked if poor assistance from parents and guardians is one of the hindering factors on the ability of children with disabilities to access digital services. Based on the findings from Table 5 revealed that 37% of the respondents agreed that poor assistance from parents or guardians is also the hindering factor on the ability of children with disabilities to access digital services in the study area. Also, 32% strongly agreed, 7% were neutral, 10% disagreed and 14% strongly disagreed. This implies that, even though the parents and guardians are playing their roles to help the children with disabilities still there is a challenge of close assistance from parents and guardians in helping these children access digital services in the study area. One of the parents said,

*“We do not have enough time to stay and help children with disabilities when they want our closest help. Most of the time we are busy at workplaces and sometimes when we are at home, you will find us busy with home activities, so we lack time to help the children with disabilities when they want to access digital services”.*

| **Table 5: Poor Assistance from Parents or Guardians**  |
| --- |
|  | **Frequency** | **Per cent** |
| Strongly Agree | 23 | 32 |
| Agree | 27 | 37 |
| Neutral | 5 | 7 |
| Disagree | 7 | 10 |
| Strongly Disagree | 10 | 14 |
| **Total** | **72** | **100** |

1. **CONCLUSION**

This paper has discussed the factors hindering the ability of children with disabilities to access digital services in Zanzibar. The results indicate that there are present factors hindering the ability of children with disabilities to access digital services in the study area. The study found that the majority of the respondents strongly agreed that, financial factors, environmental factors and lack of knowledge of digital technologies are the hindering factors on the ability of children with disabilities to access digital services. Also, the respondents agreed that lack of assistive devices and poor assistance from parents or guardians are also the hindering factors on the ability of children with disabilities in the study area. Generally, based on the findings, there is a need for the whole community to work together so as to address these challenges in order to ensure the improvement of the ability of children with disabilities to access digital services. In addition, more researches are needed to investigate the hindering factors among the children with disabilities in the study area.

COMPETING INTERESTS:

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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Details of the AI usage are given below:

1.

2.

3.

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