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Traversing the AI Terrain: Opportunities for Those Living with Disabilities

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Abstract: *The emergence of artificial intelligence has brought positive and negative implications to the socio-economic lives of individuals. Whilst AI is one of the information communication technology tools, its utilisation and exploitation remain a source of contestation among People with disabilities. The major argument is how it will minimise the barriers created by disability. This study explores the views of those living with disabilities on the nature of opportunities that can be used to address the plight of those living with disabilities. The study adopted the qualitative approach, where purposively selected students and lecturers with disabilities responded to semi-structured interviews on the nature of their disability and what they think should be done to improve their plight. The case study design was adopted. Data from the interviews were thematically and content analysed. The findings revealed that People with disabilities look forward to artificial intelligence as a panacea and fortune to some of the barriers they encounter due to their disabilities. The study recommends that researchers should engage strongly with People with disabilities in order to come up with AI tools that can improve the livelihood of People with disabilities.*

Keywords: *Artificial intelligence; Assistive Devices; Inclusivity; People with disabilities: Hard of Hearing; visually impaired;*

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1. Introduction

The swift evolution of artificial intelligence (AI) has transformed multiple aspects of human existence, spanning education, employment, healthcare, and social interactions (Brynjolfsson & McAfee, 2017). As an essential component of information and communication technology (ICT), AI has exhibited its ability to enhance efficiency, refine decision-making, and automate intricate processes (Russell & Norvig, 2021). Nevertheless, despite its progressive capabilities, AI continues to be a subject of debate, especially regarding its impact on marginalised communities, such as individuals with disabilities. A key concern is the extent to which AI can dismantle the obstacles faced by People with disabilities in their daily lives. While some perceive AI as an enabler of inclusivity, others worry that it could deepen existing disparities if not developed with accessibility in mind (Floridi et al., 2018).

The convergence of AI and disability presents both prospects and challenges. AI-powered assistive tools, including speech-to-text software, intelligent prosthetics, and navigation systems, provide unparalleled support to People with disabilities, enhancing their autonomy and social inclusion (Hersh, 2020). However, issues such as accessibility, ethical considerations, and the digital divide must be carefully examined to ensure AI serves all individuals equitably (West, 2019). As a result, incorporating the perspectives of People with disabilities into AI research and development is crucial for designing solutions that genuinely address their needs.

People with disabilities have historically encountered considerable socio-economic hurdles that restrict their participation in education, employment, and other

societal activities (Shakespeare, 2018). Although conventional assistive technologies have made strides in mitigating some of these challenges, they often fall short in providing holistic solutions. The advent of AI presents an opportunity to redefine accessibility and foster inclusivity by creating adaptive systems tailored to the specific needs of People with disabilities (Bigham et al., 2010).

The incorporation of AI into assistive technologies has already yielded promising outcomes in diverse fields. AI-enabled screen readers and voice assistants have notably improved communication for individuals with visual impairments, while predictive text and automated sign language interpretation have facilitated interaction for those with speech and hearing disabilities (Marr, 2021). In the education sector, AI-driven personalized learning tools have the potential to accommodate students with varying cognitive and physical disabilities, ultimately improving their academic experiences and performance (Luckin et al., 2016).

Despite these advancements, the potential of AI to address disability-related barriers remains underexplored, particularly from the standpoint of People with disabilities. The plight of people with disabilities becomes huge in most developing countries, and Zimbabwe is not exceptional, where, in most cases, assistive devices are scarce. When resources are scarce, people with disabilities are at the receiving end. And where a few resources are availed, very little is done to establish their views. This scenario is more prevalent amongst people with sensory impairment, such as hearing and visual impairment. Empirical research is needed to capture their perspectives on the opportunities and limitations of AI in improving their quality of life (Goggin & Ellis, 2020). This study aims to fill this knowledge gap by investigating the views of People with disabilities and educators regarding how AI can be leveraged to mitigate challenges associated with disabilities. The major question to be addressed by the study is: What opportunities does AI provide to People with disabilities? From this main question, the following sub-questions were generated;

1. What challenges do the visually and hearing-impaired face in an inclusive environment?
2. What opportunities arise from Artificial Intelligence?
3. How can the emergence of AI improve the plight of the visually and hearing-impaired people?

The findings from this study are expected to contribute to ongoing discussions on AI and inclusivity by highlighting the distinct needs and expectations of people with disabilities.

2. Literature Review

2.1 Theoretical Framework

The study is grounded in the Disability Rights and Capability Approach Theoretical framework. The Disability Rights framework emphasized the rights of people with disabilities to equal access, opportunities, and participation in society. The Capability Approach Framework focuses on enhancing the capabilities of individuals to achieve their goals and aspirations, leading to improved human development and well-being. Three major tenets of the theory are: capabilities, which are the ability to achieve certain valuable functions or states of being; functioning, which is the actual achievement an individual can achieve; conversion factors, which are the personal, social, and environmental factors that affect an individual to convert resources into capabilities. Informed by this theory, the study thus seeks to expand the capabilities of People with disabilities, remove the possible barriers that prevent people with disabilities from participating in all aspects of society, and lastly to promote inclusive policies that promote the inclusion of people with disabilities. Informed by this theoretical framework, the study employed a qualitative methodology that includes semi-structured interviews, with a view to providing valuable insights into the design and implementation of AI tools that maximize benefits for People with disabilities

2.2 Exposition of the world of disabilities

Disability is a multifaceted and complex reality that affects millions of people worldwide (World Health Organization [WHO], 2021). It encompasses a wide range of physical, sensory, intellectual, and mental health impairments that can impact an individual's ability to navigate societal structures designed primarily for able-bodied individuals (Shakespeare, 2018). The world of disabilities is characterised by both visible and invisible challenges, including barriers to education, employment, healthcare, and social inclusion (Oliver, 1990). While some disabilities are congenital, others may result from illness, accidents, or aging, making disability an evolving condition that requires adaptive responses (Barnes & Mercer, 2010).

Historically, people living with disabilities (People with disabilities) have faced systemic discrimination, exclusion, and marginalisation (Groce, 2018). Societal attitudes, stigmatisation, and lack of accessible infrastructure have often limited their opportunities for full participation in economic, social, and cultural life (Emerson et al., 2012). However, in recent years, there has been a significant shift towards inclusivity, with policies and technological advancements working to dismantle these barriers (United Nations, 2019). The emergence of artificial intelligence (AI) offers new possibilities for improving accessibility and independence for People with disabilities, potentially transforming their interactions with the world (Hersh, 2020).

Despite these positive strides, numerous challenges persist, particularly in terms of accessibility,

affordability, and the digital divide (Goggin & Ellis, 2020). Ensuring that AI and other technological solutions address the needs of People with disabilities requires active engagement with affected communities (Minges, 2019). By understanding the diverse experiences and challenges faced by People with disabilities, society can foster an inclusive environment where technology serves as an enabler rather than a barrier (West, 2019).

This study delves into the perspectives of individuals with disabilities, more particularly the visually and hearing impaired, regarding AI's potential role in alleviating their challenges. By engaging with students, educators, and stakeholders, it aims to highlight ways in which AI can be harnessed to create a more equitable society. The findings will contribute to the broader discourse on disability rights, accessibility, and technological inclusivity, emphasizing the importance of user-centered innovation in addressing the unique needs of People with disabilities (Bigham et al., 2010).

Challenges of those living with disabilities

Individuals living with disabilities encounter a myriad of challenges that affect their daily lives, social inclusion, and economic participation. One of the most significant barriers is limited access to education. Many educational institutions lack the necessary resources, such as assistive technologies and inclusive teaching methodologies, to accommodate students with disabilities (Shakespeare, 2018). This disparity often results in lower literacy rates and reduced academic achievements among People with disabilities compared to their non-disabled peers (Emerson et al., 2012).

Another critical challenge is employment discrimination. Despite international frameworks advocating for equal employment opportunities, People with disabilities often face prejudices that limit their participation in the labour market (Barnes & Mercer, 2010). Many workplaces remain inaccessible due to architectural barriers, lack of adaptive technologies, and employer biases regarding productivity and efficiency (Oliver, 1990). Consequently, unemployment rates among People with disabilities are significantly higher than the general population, perpetuating cycles of economic dependence and social exclusion (WHO, 2021).

Healthcare access is another fundamental issue. People with disabilities frequently encounter inadequate healthcare services, stemming from physical inaccessibility, lack of trained medical personnel, and financial constraints (Groce, 2018). Many healthcare providers lack awareness of disability-specific health concerns, leading to misdiagnoses or insufficient medical interventions (Minges, 2019). Furthermore, financial barriers often make essential medical equipment and rehabilitative services unattainable for those in lower-income groups (United Nations, 2019).

Social stigma and discrimination further exacerbate the challenges faced by People with disabilities. Negative societal attitudes and stereotypes often result in marginalisation, reduced social interactions, and mental health struggles (Goggin & Ellis, 2020). This exclusion is evident in both community settings and policy-making processes, where People with disabilities often have limited representation and voice (West, 2019). Without systemic efforts to promote inclusion and accessibility, these individuals continue to experience alienation from mainstream society.

Lastly, the digital divide poses a growing concern in an increasingly technology-driven world. Many digital platforms and AI-driven innovations are not designed with accessibility in mind, restricting People with disabilities from fully benefiting from technological advancements (Bigham et al., 2010). Ensuring equitable access to digital tools and fostering inclusive design practices are crucial in bridging this gap and empowering People with disabilities to participate fully in society.

Addressing these challenges requires a multi-faceted approach involving policy reforms, technological innovations, and societal attitudinal shifts. By recognizing and mitigating these barriers, society can work towards a more inclusive and equitable future for individuals living with disabilities.

Affordances in place

Despite the challenges faced by People with disabilities, several affordances have been established to enhance accessibility, inclusion, and quality of life. These include legislative frameworks, assistive technologies, inclusive education policies, and community support initiatives that work towards removing barriers and creating equitable opportunities for individuals with disabilities.

Legislative and Policy Frameworks

Globally, several international frameworks advocate for the rights of People with disabilities. The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) (United Nations, 2006) is a landmark treaty that promotes equal rights and accessibility for individuals with disabilities in education, employment, and healthcare. The Sustainable Development Goals (SDGs), particularly Goal 4 (Quality Education) and Goal 10 (Reduced Inequalities), emphasise the need to ensure full inclusion and equal opportunities for People with disabilities (United Nations, 2015). Additionally, the World Health Organization (WHO) Global Disability Action Plan (2014-2021) aims to enhance health equity and access to rehabilitation services for People with disabilities (WHO, 2014).

At the regional level, the African Charter on Human and Peoples' Rights (1981) and its Protocol on the Rights of Persons with Disabilities in Africa (2018) outline commitments by African states to promote the rights and dignity of People with disabilities. The Southern African Development Community (SADC) Disability Framework (2012) provides guidelines for member

states to implement disability-inclusive policies in areas such as education, healthcare, and employment (SADC, 2012). Furthermore, the African Union (AU) Agenda 2063 underscores the importance of inclusive development and the protection of marginalised groups, including People with disabilities (African Union, 2015).

In Zimbabwe, several policies and legislative instruments seek to address the challenges faced by People with disabilities. The Constitution of Zimbabwe (2013) recognises disability rights and mandates the government to implement measures that promote inclusion and equal opportunities (Government of Zimbabwe, 2013). The Disabled Persons Act (1992, amended 1996) provides legal protection against discrimination and emphasises accessibility in public infrastructure and services. In addition, the National Disability Policy (2021) aims to mainstream disability issues into all sectors of development, ensuring that People with disabilities have equal access to education, employment, and healthcare (Government of Zimbabwe, 2021). The Education Amendment Act (2020) strengthens inclusive education by mandating schools to accommodate learners with disabilities through infrastructure adjustments and assistive technologies. The Labour Act and Equal Opportunities Policy further advocate for non-discrimination in employment and the workplace, promoting the economic participation of People with disabilities.

These legislative and policy frameworks, complemented by technological and social initiatives, play a crucial role in enhancing accessibility and improving the quality of life for People with disabilities. However, continuous monitoring, enforcement, and refinement of these policies are necessary to ensure their effectiveness in addressing the evolving needs of People with disabilities in Zimbabwe and beyond.

Assistive Technologies

Technological advancements have played a crucial role in improving the lives of People with disabilities. Assistive technologies, such as screen readers, speech-to-text software, AI-powered prosthetics, and adaptive learning tools, have enhanced accessibility in education, employment, and daily living (Hersh, 2020). Innovations like smart wheelchairs and AI-driven navigation systems help individuals with mobility impairments navigate physical spaces with greater independence (Bigham et al., 2010). Additionally, AI-based applications that facilitate sign language interpretation and real-time captioning are increasing accessibility for individuals with hearing impairments (Marr, 2021).

Inclusive Education Policies

At the global level, inclusive education policies have been championed to ensure equitable learning opportunities for People with disabilities. The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) mandates that all signatory states provide inclusive and quality education for individuals with disabilities, promoting mainstream integration and individualised support (United Nations, 2006). The Sustainable Development Goals (SDGs), particularly Goal 4 (Quality Education), emphasizes inclusive education as a key driver of equity and social development (United Nations, 2015). Furthermore, UNESCO's Education for All (EFA) Initiative underscores the need for accessible learning environments, advocating for digital resources such as Braille, audiobooks, and sign language interpretation to support People with disabilities (UNESCO, 2017).

In the employment sector, the International Labour Organisation (ILO) Vocational Rehabilitation and Employment (Disabled Persons) Convention (No. 159) encourages nations to implement policies that ensure equal work opportunities for People with disabilities, emphasising non-discrimination and reasonable workplace accommodations (ILO, 1983). AI-driven hiring processes are increasingly being developed to eliminate biases, allowing People with disabilities to compete in the labour market based on merit rather than physical ability (Shakespeare, 2018).

Across Africa, efforts to integrate People with disabilities into mainstream education and employment systems have been guided by several regional policies. The African Charter on Human and Peoples' Rights and the Protocol on the Rights of Persons with Disabilities in Africa mandate that member states implement inclusive education policies and workplace accommodations to foster economic participation (African Union, 2018). Similarly, the Southern African Development Community (SADC) Disability Framework (2012) provides regional guidelines for the inclusion of People with disabilities in national development strategies (SADC, 2012). Additionally, the African Union (AU) Agenda 2063 promotes inclusive social and economic policies, ensuring that People with disabilities are not marginalized in key sectors such as education, employment, and digital innovation (African Union, 2015). Many African universities are now integrating assistive technologies into their curricula, offering digital course materials in multiple formats, including Braille, audio, and enlarged text, to facilitate access for students with disabilities (West, 2019).

In Zimbabwe, multiple policies have been introduced to improve access to education and employment for People with disabilities. The Constitution of Zimbabwe (2013) explicitly recognises the rights of persons with disabilities and calls for measures that promote social inclusion (Government of Zimbabwe, 2013). The Disabled Persons Act (1992, amended 1996) provides a legal framework against discrimination, ensuring that People with disabilities have equal access to education, employment, and public services. In the education sector, the National Disability Policy (2021) was launched to strengthen inclusive education practices, integrating assistive technologies into learning environments and

mandating teacher training programs focused on disability awareness (Government of Zimbabwe, 2021). The Education Amendment Act (2020) further reinforces this commitment by requiring schools to accommodate learners with disabilities through specialised curricula and accessible infrastructure.

Employment policies, such as the Labour Act and Equal Opportunities Policy, advocate for non-discriminatory hiring practices and workplace adjustments that enable People with disabilities to participate fully in the workforce (Zimbabwe Ministry of Labour, 2020). AI-driven recruitment tools and flexible work arrangements are increasingly being embraced to enhance accessibility for People with disabilities in professional settings (Goggin & Ellis, 2020).

Beyond legislative measures, various community-based initiatives and non-governmental organisations (NGOs) play a crucial role in supporting People with disabilities. At the international level, organisations such as Humanity & Inclusion (HI) and World Vision provide assistive devices, vocational training, and advocacy programs to enhance disability inclusion (Groce, 2018). Regionally, the African Disability Forum (ADF) works to unify disability organisations across the continent, promoting capacity-building programs and advocating for policy changes (ADF, 2017).

In Zimbabwe, NGOs such as the National Council of Disabled Persons of Zimbabwe (NCDPZ) and the Leonard Cheshire Disability Zimbabwe Trust offer essential services, including assistive technology provisions, educational sponsorships, and employment training for People with disabilities (Minges, 2019). Peer mentorship and support networks further empower individuals, fostering self-reliance and community integration (West, 2019). Although individuals with disabilities continue to face significant challenges, various international, regional, and national affordances have been implemented to promote inclusivity. Legislative protections, technological advancements, inclusive education policies, employment accommodations, and community-driven initiatives collectively contribute to enhancing the quality of life for People with disabilities. However, continued advocacy, policy refinement, and enforcement are necessary to ensure that these affordances effectively address the evolving needs of People with disabilities. By leveraging these resources and fostering collaborative efforts, society can move towards a more accessible and equitable future for all individuals, regardless of ability.

While individuals with disabilities continue to face significant challenges, the affordances in place demonstrate progress toward greater inclusivity and accessibility. Legislative protections, technological innovations, inclusive education policies, employment accommodations, and community support systems collectively contribute to improving the quality of life for People with disabilities. However, continuous efforts are required to ensure that these affordances remain effective and adapt to the evolving needs of People with disabilities. By leveraging these resources and engaging in further research, society can work towards a more equitable and accessible future for all individuals, regardless of ability.

How can we improve their plight?

Improving the lives of People with disabilities requires an intersectional approach that integrates technology, accessibility, social inclusion, and empowerment. Artificial Intelligence (AI) presents an innovative opportunity to address many challenges faced by individuals with disabilities, but its potential can only be fully realised through intentional design, advocacy, and ongoing engagement with the disabled community. Below are several ways we can improve the lives of People with disabilities, based on research, technology integration, and social initiatives:

Enhanced Accessibility through AI-Powered Assistive Technologies

AI has significant potential in creating tools that help reduce barriers to mobility, communication, and employment for People with disabilities, for instance:

1. Speech recognition tools can assist individuals with hearing impairments by transcribing spoken words into text in real-time.
2. Smart prosthetics and AI-driven mobility aids can help people with physical disabilities regain independence. AI can be used to improve the responsiveness and adaptability of prosthetic limbs, enabling users to better interact with their environments.
3. Visual recognition software can assist visually impaired individuals by narrating the surrounding environment or reading printed text aloud.
4. AI chatbots and virtual assistants can enable individuals with cognitive impairments or learning disabilities to access and interact with digital content more effectively.

Personalised AI-Based Education and Learning Tools

AI can revolutionise education for people with disabilities by providing customised learning experiences based on the individual's specific needs and abilities:

- Adaptive learning platforms can adjust the pace and complexity of educational content to accommodate students with diverse cognitive or physical challenges.
- AI can assist with real-time translation and transcription, facilitating access to classroom

materials for students with hearing or language barriers.

- Speech-to-text and text-to-speech technologies can help individuals with dyslexia or other learning disabilities engage with academic content more effectively.

Improved Employment Opportunities

The use of AI in the workplace can help create more inclusive environments for People with disabilities. AI tools can assist in:

- Job matching platforms, powered by AI, can recommend job opportunities that align with an individual's abilities and preferences, thus addressing barriers to employment faced by individuals with disabilities.
- Remote work options facilitated by AI-enabled tools allow individuals to perform tasks in flexible environments, making it easier to balance personal and professional lives.
- AI-driven workplace accommodations, such as virtual assistants and task management apps, can ensure that people with cognitive, physical, or sensory impairments have the same opportunities as their non-disabled counterparts.

AI-Driven Social Inclusion

AI can play a crucial role in addressing social isolation and improving the overall well-being of individuals with disabilities by fostering inclusion and equal participation in society:

- Social robots or virtual companions, powered by AI, can help reduce loneliness by providing companionship to people with mental health disorders or cognitive impairments.
- Inclusive design in digital platforms can ensure that online content, services, and products are accessible to People with disabilities. AI can assist in evaluating and improving website or app accessibility for people with visual, auditory, or physical disabilities.

AI in Healthcare and Rehabilitation

AI offers valuable tools to enhance healthcare for people with disabilities by offering personalised care solutions:

- AI-driven health monitoring tools can track vital signs, detect early warning signs, and offer predictive care for people with chronic disabilities, such as mobility limitations or neurological conditions.
- Robotic exoskeletons, powered by AI, can aid in physical rehabilitation by enabling individuals with mobility impairments to regain movement through personalized and adaptive support.
- AI-based diagnostic tools can provide more accurate and timely assessments, ensuring that People with disabilities receive appropriate medical interventions.

Policy Advocacy and Ethical AI Development

For AI to genuinely improve the lives of People with disabilities, it is essential to engage with the community, policymakers, and AI developers in a way that prioritises ethical, inclusive practices:

- Researchers and AI developers must involve People with disabilities in the design and testing of AI tools to ensure that these tools effectively address their unique needs and experiences.
- Policies that support the accessibility of AI tools and ensure that individuals with disabilities are not excluded from technological advancements must be People with disabilities are designed with universal accessibility principles, ensuring that technology is not just available but equitable for all.

Public Awareness and Community Support

Raising awareness about the potential of AI for People with disabilities and fostering an environment of social acceptance and support is essential:

- Campaigns aimed at educating both the general public and institutions about the capabilities of AI to enhance the lives of individuals with disabilities can help reduce stigma and increase acceptance.
- Collaboration with non-governmental organisations (NGOs), advocacy groups, and community leaders can ensure that AI tools are accessible, affordable, and tailored to the needs of People with disabilities

3. Methodology

3.1 Design

The study adopted the interpretivist paradigm. The necessity to understand the subjective world of participants necessitated the use of this paradigm. Researchers wanted to focus on the meanings and interpretations of those living with disabilities on the opportunities of AI and what these mean to their contexts. Because of these assumptions, reality is socially constructed and the participants' views cannot be generalised. The qualitative approach was used as it is in sync with the paradigm. Qualitative methods were employed to gather rich contextual data. Qualitative researchers gather rich contextual data, hence the

adoption of a case study design. We treated People with disabilities as a case which needs special treatment and in-depth analysis for us to understand their plight better.

3.2 Data Collection instruments and sampling technique

Semi structured interviews were held with 5People with disabilities, three VI and 2 HI. These two categories of disability fall under sensory impairment hence require special attention. Their lived experiences were paramount for us to understand their plight better. Who would tell better their experiences beside them? The participants were purposively selected. People with sensory impairments are few in tertiary institutions hence we sought for those who would provide us with relevant information. In addition to that, the phenomenon of artificial intelligence is only understood better by someone with a basic to moderate academic knowledge.

3.3 Data collection and analysis

Before the interviews, we sought for the participants' consent to participate in the study. We assured them of confidentiality and protection against any form of harm. Interviews were held at the participants' places for convenience. The research team comprised of a visually impaired and special needs lecturers. The composition instilled confidence and trust in the participants and that made them to say out their minds freely. Data from the interviews were analysed thematically.

4. Results and Discussion

Data from the interviews and unstructured questions were coded and presented in themes. Codes such as VI and HI were used to denote Hearing Impaired and VI people who are Visually Impaired respectively. Pseudonyms were used for confidentiality reasons. The following themes were generated:

a. *Major barriers and challenges for people with disabilities to operate in an inclusive environment*

b. Artificial Intelligence or ICT tools they know

c. How ICT or Artificial Intelligence has assisted PWD in overcoming the major barriers.

d. Whether PWD find the emergence of AI assisting them operate in an inclusive environment.

e. What they think Artificial Intelligence should do to overcome some of the challenges they encounter as persons with disabilities

Major barriers and challenges for People with disabilities to operate in an inclusive environment

There was concurrence from all participants that barriers still exist for people with disabilities. Both categories of disabilities concur that there were environmental barriers although the barriers were specific to the category of disability. For those who were hard of hearing the major barrier was lack of interpreters. There were no competent interpreters to interpret for those with profound and hard of hearing. Put in Wendy's words, "Lack of Sign language interpreters-knowledge of Sign language by service providers, poorly trained service providers, prohibitive costs of Assistive devices are some of the challenges we encounter as People living with Disabilities"
The issue of lack of and little knowledge of sign language has negative implications on the advancement of those who are hard of hearing. This issue was highlighted by Jennifer, who said that those who are hard of hearing lack medical information and professional advancement.

Whereas those who are hard of hearing or profound hearing have their own barriers, the Visually Impaired cited physical or environmental barriers which are natural such as rough terrain, physical obstacles which can block them because they cannot see, they need to adapt to the environment first for them to know and familiarise with it. Secondly, more often than not, most people operate as if there are no PWD amongst them.

"You have a scenario where people in a meeting distribute hard copies of minutes or documents to a visually impaired person, how do they expect him/her to read?" said Chipo (VI).

One of the participants, Thomas (VI) weighed in to say, "… the issue of affordability and accessibility are stumbling blocks as some of these ICT gadgets and software are too expensive for many of us. Just imagine a white cane goes for US$10-US$15>."

ICT tools Participants knew

Participants were also expected to name the ICT tools and affordances they know and to indicate how they have been assisted to minimise the barriers. The following were the findings from the participants: Screen readers, Speech recognition software, Smart assistants, Meta AI, PALF, Deep Seek, Apple Intelligence, and ChatGPT. Live Transcribe for transcribing audio to text were identified by those with hearing impairment. Screen readers and Meta AI topped the list.

Those with visual impairment identified: screen reader, smart phones, Jaws, NVDA and Look out. Whilst the former three help the visually impaired to navigate the laptop or cell phone the latter is installed on a phone to identify the currencies. Noria (VI), a participant aptly describes it, "Look out helps me detect currencies such as US$, Rands even our local currency. I can know how much it is without the help of someone…" NVDA, which is non visual desk access is like Jaws it helps one to navigate the laptop.

"Some ICT gadgets such as embossers are very helpful as one needs to read and write and at times one can read alone for instance Mathematics symbols, even equations need someone to read alone", echoed Thomas (VI).

How ICT or Artificial intelligence have assisted PWD in overcoming the major barriers

The researchers also sought to establish how the affordances assisted those with disabilities. Most participants indicated that ChatGPT and Meta AI help them with useful information.

Martha (H-o-H) had this to say, "Use of transcription services helps me where there are no interpreters. And using AI helps me with proposal development. Image generation and simplifying documents for deaf people."

In addition to that Tom (H-o-H) erred "… Yes, automatically generated captions or subtitles on You Tube that are not subtitled help me a lot."

On the other hand, Noria, who is blind intimated that "AI helps me to overcome barriers through the provision of voice or sound. Jaws guides one when you strike a key, it says its name while Look -out helps someone to know the amount of money one has. I now know the amount of money in my purse, even when I go to the market I don't have problems at all!"

Whether PWD find the emergence of AI assisting them in operating in an inclusive environment?

There was confirmation from all the participants that AI has brought relief to the barriers they used to experience without these affordances; the emergence of AI and ICT in general has made them included. The following excerpts support the benefits people with visual and hearing disabilities have accrued from ICT and AI.

Wherever I have a sound, I am included. I really appreciate the emergence of ICT (Noria, VI)

"AI has also helped us in terms of privacy and independence, which are very important aspects in life. Without which you are not respected. We now have software to tell one what is surrounding you and Software to describe the pictures on the TV", said Thomas (VI).

What can be done to overcome challenges of AI

Participants were asked to suggest what they think should be done to overcome the challenges.

Thomas (VI) stated that "…one of the most fundamental things is to address the affordability and accessibility aspects. Things like magnifying glasses, smart phones, should be affordable. People should not think it's a burden to provide inclusive facilities like talking robots, white canes, braille displays, etc so that we can move freely without an assistant because the assistant is also an extra cost" Noria weighed in to say AI should be applied even in vehicles so that I can move alone. We also want our white canes to talk to us so that even when you are moving alone it can tell that you are now close to a pit so that you won't fall…"

Findings revealed that almost all the participants had better expectations of the ICT affordances and/or AI. For instance, the HoH expected that AI could help with interpreting live transcription Generation of information videos in Sign language and AI tools should be adaptable to individual needs as well as enhancing natural language processing. That would encourage user feedback. Lastly, PWD felt that individuals with disabilities should not be left out in the design and testing of AI tools.

4.2 Discussion of findings

The findings revealed several challenges experienced by those living with disabilities, particularly those with visual and hearing impaired or hard of hearing. Because of the differences in their impairments, it was also clear that their challenges, experiences, perceptions of AI and their expectations were different. However, as West (2019) says understanding the diverse needs of those living with disabilities permits us to create an inclusivity environment. Almost all participants revealed that PLWD are beset with challenges. Those with HI revealed that they encountered communication challenges ranging from lack of interpreters for sign language and inadequate Assistive devices. The issue of assistive devices was common to all participants acknowledging Goggin and Ellis's 2020 assertion that most PLWD have challenges. This challenge is exacerbated by the economic background of the member. Those who are poor or are from the poor background are the most affected.

It was also revealed that participants knowledge of AI was limited to CHATGPT, Meta AI and screen readers for those with HI whilst those with VI cited JAWS, Look out and NVD. There was a testament of the benefits participants derive from the use of AI. This has narrowed the gap between 'the disabledness' and 'the ableness'. The VI could identify notes without the assistance of an aid. These findings confirm Hersh's (2020) assertion that Assistive technologies have enhanced accessibility in education, employment and daily living of People with Disabilities. Whilst AI has brought relief to those with disabilities there was that clarion call that AI should be contextual and cultural relevant especially to the deaf. What it means is that it should be developed with the full participation and consultation of the people it is meant for. This buttresses the view that '…what is for us without us'.

5. Conclusions and Recommendations

5.1 Conclusion

From the findings of the study it can be concluded that despite inclusivity being instituted in almost all institutions of Higher learning in Zimbabwe the visually

and hearing impaired continue to experience challenges in the form of inadequate assistive devices. Most of these are too expensive for many. The advent of AI has brought great promise in addressing the challenges faced by people with disabilities, but it is vital to approach its development and implementation with a clear focus on inclusivity and accessibility. By leveraging the power of AI in assistive technology, education, employment, healthcare, and social inclusion, we can create a more equitable society that empowers people with disabilities to lead independent, fulfilling lives. AI software such as screen readers and speech recognitions have assisted the Hearing impaired whilst soft wares like JAWS, Look Out and NVD have assisted the visually handicapped. Both the VI and HI had found CHATGPT and MetaAI useful AI tools. It was also concluded that engaging directly with People with disabilities in the research and design process will ensure that these technologies genuinely meet their needs and contribute to their well-being.

5.2 Recommendations

The study recommends that:

The cost of assistive devices should be affordable since most of the PWD are economically disadvantaged. Furthermore, People with disabilities should be actively involved in shaping the technologies meant to serve them. Ultimately, this study advocates for stronger collaborations among researchers, technology developers, and People with disabilities to create AI-driven innovations that are both accessible and effective in overcoming disability-related obstacles

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