Recognition of deaf students in promoting TVET access: Inclusion of sign language in higher education

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Abstract—Despite international, regional, and national policies advocating for the inclusion of people with disabilities, such as hearing impairments, sign language remains marginalised in Zimbabwe's Technical and Vocational Education and Training (TVET) institutions. This presents a significant barrier to access and meaningful participation for deaf students, as sign language is the primary mode of communication linking them to education, employment, and economic opportunities. This study aimed to explore how the inclusion of sign language can be enhanced in TVET institutions in Zimbabwe to promote equitable access and improve educational outcomes for deaf learners, contributing to sustainable development goals. This research employed a qualitative approach grounded in the constructivist paradigm, utilising a multiple case study design. Data were collected through semi-structured interviews and focus group discussions. Participants were selected through purposive sampling. Thematic analysis was used to analyse data. Findings revealed critical shortages of sign language specialists and interpreters, inadequate infrastructure, and limited inclusion of sign language in the curriculum and teaching methodologies. Participants highlighted the need for training more deaf disability experts, revising policies to align with deaf learners' needs, adopting a sectoral collaborative approach involving various stakeholders, and enhancing skill-building opportunities for deaf students. This study implies that addressing human resource gaps, improving institutional infrastructure, and reforming policies are essential for fostering an inclusive educational environment in TVET institutions. Such interventions would improve the access and retention of deaf students in TVET institutions, which in turn contribute to their socio-economic empowerment.
Keywords: Deaf students, Higher education, Inclusive education, Sign language, TVET access

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I. INTRODUCTION

THERE has been a budding acclaim globally for the public sector's potential to assist people who are differently abled (Lister et al., 2022). As a result, the concept of inclusion and inclusive education has gained worldwide prominence through the advocacy it received from the United Nations (UN). The United Nations designated education as a fundamental human right (Vasiliki et al, 2023). This development followed the 1994 UN resolutions that arrived at Salamanca, which compelled member states to produce policies acknowledging the importance of inclusive education. Nations have pursued inclusive education since the Dakar Declaration of 2000 (Vasiliki et al, 2023), which further reinforced the 1990 World Declaration on Education for All signed in Jomtien.

Furthermore, the United Nations Sustainable Development Goal (SDG) number 4 calls for inclusive and equitable quality education for all, making education accessible and affordable and leaving no one behind (Vasiliki et al, 2023). The Sustainable Development Goals, target 4.3, call for nations globally to ensure equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university education by 2030 (Murphy & Stott, 2021; United Nations Educational, Scientific and Cultural Organisation [UNESCO], 2022). Despite enormous strides towards inclusivity globally, significant differences in access and completion, particularly due to people's different backgrounds, are still a distinguishing feature of most higher education systems. Education at all levels is not in pace with global expectations. The move towards inclusive education has been akin to a ship sailing in stormy and uncertain waters, ruthlessly assailed by winds of change. The positive news is that the commitment to attain inclusivity worldwide remains strong (Lister et al., 2022). Higher education is critical in preparing men and women for the future. It is fundamental in advancing the United Nations Sustainable Development Goals (UN, 2022). According to Mutongoreni and Mbohwa (2025), this explains why governments are interested in shaping the direction of higher education institutions.

In Zimbabwe, equal access for all women and men to affordable and quality technical, vocational, and tertiary education, including university education, is of remotest concern, particularly for the deaf or hard-of-hearing students. Zimbabwe has about 15 million people (ZIMSTAT, 2022) and a deaf population of about 200,000 (Matende et al., 2023). According to the 2013 Constitution, Zimbabwe has sixteen official languages, namely Chewa, Chibarwe, English, Kalanga, Koisan, Nambya, Ndau, Ndebele, Shangani, Shona, sign language, Sotho, Tonga, Tswana, Venda, and Xhosa (Matende et al., 2023).

The recognition of sign language has renewed calls for research, regulatory and policy frameworks, and planned activities to be directed toward hitherto marginalised languages to revitalise them. The Convention on the Rights of Persons with Disabilities (CRPD) is an international human rights convention that sets out the fundamental human rights of people with disability (Musengi, 2019), including those who are deaf and hard-of-hearing. According to Musengi (2019), the provision of education to the deaf and hard-of-hearing (DHH) students grew from five special schools with 800 students in 1981, to the current

six special schools and ninety mainstream units catering for nearly 2,600 students. This development is in line with Sections 6 (3) (b) – (4), 22 (3) (c), and 63 of the Constitution of Zimbabwe's call to uphold the respect for linguistic human rights (Ndlovu & Makwavarara, 2023).

Whilst there are notable developments in providing primary and secondary education to the deaf, the same is not true at the higher education level in Zimbabwe. The enrollment rate of the higher and tertiary education sector is 8.5%, trailing behind regional leaders such as Botswana, South Africa, and Kenya (World Bank, 2020). Matende et al. (2023) argue that there is a glaring disparity regarding access to higher and tertiary education for people with hearing impairments. Zimbabwe Sign Language (ZSL), it has been argued, has been relegated to the periphery in multiple domains such as health, education, and higher education, and the legal fraternity (Musengi, 2019; Ndlovu & Makwavarara, 2023).

In the TVET sector, enrolment stood at 23,570 in 2020 (World Bank, 2020). The deaf and hard- of –hearing are marginalised in the TVET sector as most of these institutions do not use Zimbabwe Sign language as a medium of instruction. Consequently, potential TVET deaf students immigrate to towns like Harare for vending opportunities (Musengi, 2019). Mugari and Matende (2020), in their studies on Sign Language Policies, Practices and Challenges in Zimbabwe's Universities, established that higher education systems lacked clear implementation strategies for promoting sign language and instructions as espoused in the national constitution. The integration of the sign language pedagogy in higher education systems, including TVET institutions, remains an emerging and underdeveloped area (Mugari & Matende, 2020). Ndlovu and Makwavarara (2023) in their study on the Teaching and Learning of Sign Language at the University of Zimbabwe found that higher education systems do not have explicit written, collated, and consolidated language policies. The available policies, it was argued, do not guarantee access to education in sign language or other communication forms suitable for students with hearing impairments.

Vocational and academic education in Zimbabwe has remained a conduit towards improved employment skills and the tremendous economic transformations in various sectors of our lives (Chisiri et al., 2023). Munowenyu (1999) even called for the introduction of basic vocational education in schools to produce 'skilled and confident problem-solvers' even at a much lower education level. However, Vocational Education and Training (VET) has endured periods of high regard and skepticism (Katsande, 2016). While academic and university education remain the government's priority and have recently received the lion's share of financial and resource support to erect research centers, innovation hubs, and industrial parks, TVET remains underfunded and peripheral. TVET systems face multiple capacity challenges (Southern African Development Community [SADC], 2022). Matsikure et al. (2023) found that underfunding stood out amongst the challenges facing TVET institutions, which led to serious challenges in supporting students with diverse and special needs. Even though systematic reforms are taking place in the TVET sector, the financial and capital investments in TVET in most of the SADC Member States are very low (SADC, 2022). The marginal treatment, skepticism, and the underfunding could be born out of the general perception among the SADC member states and their citizens that TVET is "a route for those who have failed and cannot manage to survive in the academic setting."

This underfunding and peripheral treatment of TVETs exists despite education, particularly vocational education (career and technical education), having been seen as a tool for servicing the developmental needs of society. Enrolment rates of girls and special needs youths in TVET are low despite Member States implementing policies and strategies to promote and increase access of girls and special needs youths in TVET (SADC, 2022). Teachers play significant roles in influencing students' decisions to enroll in TVET courses (Edward et al., 2008). While the delivery of quality TVET depends on the lecturer's competence in terms of theoretical knowledge and technical and pedagogical skills, there are concerns that few vocational lecturers have

a strong blend of subject specialist knowledge, industrial experience, and pedagogical skills (SADC, 2022). Ebisine (2014 in Chisiri et al., 2023) states that the success of any education system depends largely on teachers' availability and quality. Bunoti (2011) succinctly states that no education system can be better than the quality of its teachers, and Chisiri et al. (2023) categorically posit that lecturers are a critical quality indicator in the educational process.

Although SADC member states have adopted policies and strategies to ensure equity and inclusion, in line with SDGs 4 and 5, most TVET providers globally, particularly Zimbabwe, have limited teaching and learning materials and facilities for special needs learners. The infrastructure is still unfriendly to the learners (SADC, 2022). Despite the plethora of legislations and legal frameworks such the Constitution of Zimbabwe 2013, Education Act 1996, Disabled Persons Act (Chapter17:01) and the National Disability Policy (2021), all guaranteeing and declaring provision of inclusive education at all levels of the education system in Zimbabwe, as espoused by Matsikure et al (2023), the blind and disabled continue to face universal obstructions and marginalisation. Availing sufficient educators in TVETs and higher education institutions is costly and impossible under the present economic conditions in Zimbabwe, as it is likely to put a bigger dent on the insufficient resources (Mupinga et al., 2005). TVET sector financing in the SADC region, generally, and worse off in Zimbabwe, is lower than in the other economic sectors. It therefore lacks the financial resources to maintain and renew teaching and learning equipment (SADC, 2022). Given the foregoing, this study sought to develop a model for the deep and widening access to higher education TVET institutions in Zimbabwe for people with hearing impairment.

II. PROBLEM STATEMENT

Most higher education institutions, especially TVET, do not have sign language experts or bespoke teaching and learning infrastructure (facilities and resources). It is crucial to recognise that the hearing impaired are not accessing higher education due to a plethora of reasons, including the unavailability of skilled staff, infrastructure, and teaching and learning resources, despite their potential contribution to the United Nations Sustainable Development Goals and the Zimbabwean heritage-based Education 5.0 model. International, regional, and national policies tout inclusivity of individuals living with disabilities, including the hearing impaired, but the space for sign language in higher education is still constricted. Sign language remains a peripheral language, yet it is considered one of the official languages of Zimbabwe. This is the only language that connects the deaf and hard of hearing to the world of work, socio-cultural, and other economic ecosystems, just like the non-disabled others. This research study aims to close the gap through interventions that may be employed in higher education institutions, especially TVET, to improve sign language recognition towards producing more proficient graduates. Subsequently, expertise in the area improves, which enhances their contribution to the nation's socio-economic and political development. The research is informed by the neglected potential of each citizen's potential to be aggregated, consequently gaining a meaningful summative significance to the societal (micro) and broader national (macro) economic agenda.

III. LITERATURE REVIEW
Current position on using sign language in higher education

The research published by the University of Zimbabwe in 2023, on imparting knowledge of sign language at the campus level, concluded that sign language is not recognised as an official language of instruction. A lack of exposure to students at lower levels of education mainly caused this. Kadenge and Musengi (2018) highlighted that the present situation in Zimbabwean universities is attributed to poor genetic links with other indigenous languages and a lack of sign language grammar descriptive sources. To achieve inclusive education,

the country's institutions of higher learning should embrace sign language (Mutswanga & Mapuranga, 2014). Also, Mutswanga (2017) highlighted that the country's education system should have interpreters for sign language to assist hearing-impaired individuals. Positively, the introduction of heritage-based education 5.0 philosophy has promoted the use of sign language in Zimbabwean universities. The deaf community in Zimbabwe has initiated university programmes to impart the knowledge of sign language (Musengi, 2019). Besides, the community embarked on a project to train specific deaf graduates who would be used to providing knowledge to other lecturers (Musengi, 2019). To counter the lack of sign language, the Midlands State University translated the Constitution of Zimbabwe for the convenience of deaf people (Newsday, 2019). According to Vanuatu (2018), developing sign language driven by the hearing impaired through involving professionals in sign language, interested partners, and families should be a way forward to address the current scenario in TVET institutions. Also, Mutswanga and Chataika (2016) in their research on the experiences of deaf learners in Zimbabwean universities highlighted that the universities should be non-discriminatory but always respond to the population's needs instead of the current scenario.

Countries such as Tunisia, which are technologically advanced, are now utilising microphones and receiver systems connected to the deaf learners' hearing supporters in their universities (Smillie, 2021). In Sierra Leone, for example, there are no facilities to accommodate the hearing-impaired in the universities (Baker, 2021). Mandyata and Kumukwambo (2018) in their survey on suggestions on the use of language of the hearing impaired, found that training of sign language specialists to assist in providing knowledge of sign language in Zambia at lower levels of education up to institutions of higher learning would assist in promoting inclusion in education.

Availability of human and sign language resources

There is a gap in the availability of sign language teachers in TVET institutions in Zimbabwe. In their study in Zimbabwe, Musengi and Chireshe (2012) stressed the need for sign language teachers and interpreters. They found that, despite wearing hearing aids, most deaf students could not hear the spoken languages used by teachers. This necessitates sign language interpreters to ensure meaningful learning in regular classes. Regarding the availability of sign language interpreters, Musengi and Chireshe (2012) revealed that not all mainstream teachers were conversant with sign language.

In a study in Saudi Arabia, Alawajee (2022) found a yawning gap in the body of knowledge on teachers' sign language proficiency, which is one of the primary teaching program outcomes. In another complementary study, Alofi et al. (2019) reported a lack of sign language specialists. Teachers in Saudi Arabia's deaf schools are non-deaf and may be unable to explain some of the curriculum content due to limitations in knowing or performing the correct signs (Alawajee, 2022). Furthermore, due to communication problems in sign language, some Saudi deaf people believe their teachers have received poor-quality education (Alofi et al., 2019). As the cited studies above revealed, the lack of sign language educators in tertiary institutions mirrors the inadequate sign language interpreters in TVET institutions.

A gap in the availability of sign language teachers in TVET institutions has also been identified in Africa. In their study in Zimbabwe, Musengi and Chireshe (2012) stressed the need for sign language teachers and interpreters. They revealed that despite wearing hearing aids, most deaf students could not hear the spoken languages used by teachers. This necessitates sign language interpreters to ensure meaningful learning in regular classes. On the availability of sign language interpreters, Musengi and Chireshe (2012) revealed that all mainstream teachers were conversant with sign language. This reflects a challenge in terms of the professional development of educators in sign language. Muwaniki and Wedekind (2018) argue that the professional development of TVET teachers remains fragmented and neglected. This implies that in Zimbabwe, sign language proficiency is

lacking at all levels of education due to educators' lack of professional development. This reflects the status of TVET institutions regarding the availability of human resources.

In South Africa, a shortage of sign language teachers available to teach the subject has been identified, although there was hope that the problem would be addressed over time (Zagagana, 2023). Dr Huddlestone of Stellenbosch University commended that recognizing sign language as the country's 12th official language in South Africa can be considered an opportunity to develop educational resources and increase access for deaf students to higher education (Zagagana, 2023). This would spearhead the development of educational resources and increase access for deaf students to higher education.

In a qualitative study by Mapepa (2018) in South Africa, where the study sought to identify educator reflections on support services needed for them to address barriers to learning of learners who are deaf, the results showed that there was: limited curriculum support in special schools; lack of support and inadequate teaching and learning materials; overcrowding in one school and; limited support of multidisciplinary professionals in most schools. This resonates with observations by Chireshe (2013) that lack of teachers' training, lack of interaction, academic performance, the teaching and learning process, and problems with sign language interpreters are impediments to accommodating the deaf learners in mainstream schools. The results reflect inadequate and improper infrastructure challenges and inadequate provision of necessary learning materials as notable challenges. This reflects the current challenges of accommodating deaf learners in TVET institutions in Zimbabwe.

Strategies to promote the use of sign language in TVET institutions

It is important to consider curriculum revision to promote sign language inclusion in higher education. Using old, rigid curricula has been the stumbling stone to issues like incorporating sign language in vocational training centres. Lwal (2019), in her study which aimed to evaluate the contribution of TVET education to the development of entrepreneurship among the deaf TVET graduates of KTTID in Nairobi, suggested that the technical and vocational education Training institutions reform their curriculum and policy reviews with specific impairments like the use of sign language. This was also supported by Sako (2020), who emphasised the need to involve students with disabilities in the curriculum review and modification.

Aside from the above, lecturers are essential in the education and training of those with disabilities, and their importance can only be realised if they know how best they can attend to the needs of the students. The educational and training needs of the deaf are challenging to achieve. Sako (2020) proposed the need for staff training on standard sign language skills to help them facilitate the education and training in sign language. In his study, the lack of staff development is one of the hindrances to inclusivity at TVET colleges. In support of the need for staff training, Mcintosh and Mupinga (2015) found that teachers working with special needs students lacked professional development opportunities, which might be the reason for the lack of inclusion of sign language in TVET institutions. This will require experts in sign language to facilitate the training of lecturers and all those involved, such as management. Management and lecturers also need this training to accept, appreciate, and support the use of sign language at these institutions. Training will also remove attitudinal barriers affecting students with disabilities negatively (Kemevor & Kassah, 2015), as lecturers are directly involved in the learning process. According to Sako (2020), in his study on integrating inclusivity practices at TVET colleges, collaboration with stakeholders can be helpful. Professionals such as speech therapists and interpreters need to be included in the programs at TVET institutions to assist students and lecturers, when necessary, in support of sign language.

Furthermore, infrastructure modification and provision of resources to promote sign language inclusion in higher education and e-learning are now crucial in higher and tertiary education (Vinoth & Nirmala, 2017). TVET institutions must be equipped with the necessary

infrastructure and resources to enhance easy work and motivate those teaching and learners with disabilities, since it is not easy. According to Mphongoshe et al. (2015), for all learners to excellently participate in all areas of educational programmes, physical and infrastructural modification of the learning facility and the provision of assistive devices for those learners with special needs are required.

The inclusion of sign language at the secondary education level plays a pivotal role in fostering its integration into higher education. According to Ybyrayeva (2022), upper-secondary schooling is essential, and promoting inclusion at this stage is particularly crucial. He argues that access to Technical and Vocational Education and Training (TVET) can be especially challenging for young adults with hearing disabilities if they lack a solid secondary education foundation. As such, a student's prior educational background significantly influences their ability to transition successfully into further professional education. Therefore, the effective use of sign language in higher education may largely depend on the knowledge, skills, and competencies acquired during secondary schooling.

Furthermore, awareness campaigns could be used to promote sign language inclusion in higher education. Following Kamevor and Kassah (2015), attitudinal barriers also negatively affect sign language and training for students with disabilities. On this matter, Pirzada et al. (2023) suggested awareness campaigns involving all stakeholders to help remove negative attitudes and promote an inclusive learning environment. Lwal (2019) also argued for sensitisation campaigns through different programs and stakeholders. This would enhance the implementation of laws and policies that support the use of sign language.

IV.   OBJECTVE OF THE STUDY

The study sought to develop a model for the deep and widening access to higher education TVET institutions for people with hearing impairments in Zimbabwe. The following research objectives underpin it:

1. To assess the availability and use of sign language as a medium of instruction in TVET institutions.
2. To examine the adequacy of human and material resources supporting sign language inclusion in TVET settings.
3. To develop practical strategies for enhancing access to higher education among deaf and hard-of-hearing students through sign language integration.

V.   METHODS

Research approach

The study employed a qualitative research approach. This approach is appropriate for the study because it sought to understand how individuals interpret and make sense of their experiences within specific social, cultural, and institutional contexts (Creswell, 2014). The qualitative approach prioritised depth of understanding, contextual insight, and meaning-making from the participants' perspective. It also allowed for exploring the nuanced and often marginalised voices of students who use sign language. Through qualitative inquiry, the researcher investigated how students, lecturers, and administrators perceive, experience, and respond to the inclusion (or exclusion) in their academic environments. According to Bogna et al. (2020), the qualitative research approach seeks to explore and comprehend the meanings individuals or groups attach to social phenomena. It is well-suited for exploring complex social issues, as it accommodates ambiguity, recognizes diversity, and prioritises meaning over measurement.

Research paradigm

The study was guided by a constructivist paradigm, which posits that knowledge is constructed through social interaction and shaped by cultural and historical contexts (Pilarska, 2021). Constructivism rejects the notion of a single, objective reality. Instead, it asserts that multiple realities exist and understanding emerges through the perspectives and experiences of individuals situated in specific environments (Bogna et al., 2020). This paradigm was appropriate for this study as it sought to recognise and elevate the voices of deaf students, whose experiences are often shaped by systemic marginalisation and social misunderstanding. Additionally, the constructivist paradigm provided a philosophical foundation that was ethically responsive and methodologically coherent with the study's objectives.

Research design

This study utilised a multiple case study design, which involved the in-depth, contextual exploration of three distinct TVET institutions in Manicaland Province. A case study design is particularly appropriate when the researcher seeks to gain a deep understanding of a phenomenon within its real-life setting (Yin, 2018). In this instance, each institution served as a "case" with its specific practices, experiences, and challenges related to including sign language in higher education. The multiple case study design allowed the researcher to compare institutional responses to deaf-inclusive education. It also enabled cross-case analysis to identify common patterns and unique strategies across the institutions. Additionally, this design was beneficial because it generated a comprehensive and comparative understanding of how sign language integration was approached in varied educational settings (Creswell & Poth, 2018).

Participants

Participants were drawn from three public TVET institutions using purposive sampling. This entailed selecting individuals with specific knowledge or experience relevant to the research focus (Pilarska, 2021). The sample comprised twenty-four participants, including three institutional managers (principals and heads of departments responsible for overseeing academic and administrative policies and whose input helped to contextualise the institutions' formal approaches to inclusive education, six academic staff (from departments that either admitted deaf students or had engaged in inclusive teaching practices), and fifteen students. The academic staff provided insights into curriculum design, communication challenges, and their preparedness to support deaf learners. The student participants included both deaf and hearing students enrolled in programs where deaf-inclusive practices were either implemented or lacking. Including deaf students was particularly important in capturing firsthand experiences of navigating educational spaces where sign language accessibility varied. Hearing students were also engaged to understand peer dynamics, perceptions of inclusion, and social integration within mixed-ability classrooms. This diversity of participants allowed the research to capture multiple viewpoints on the issue of sign language inclusion and to triangulate perspectives across administrative, instructional, and learner levels.

Data collection instruments

Data were collected using semi-structured interviews and focus group discussions (FGDs). This allowed both individual and group perspectives to be explored in depth. The semi-structured interviews facilitated detailed one-on-one engagement with institutional managers and academic staff. This enabled the researcher to probe key issues while allowing flexibility to follow emerging topics. Focus group discussions, on the other hand, were used to capture the collective experiences and perceptions of both deaf and hearing students regarding the inclusion of sign language in their learning environments. The FGDs also allowed students to articulate shared challenges, validate each other's experiences, and collectively suggest improvements, thus generating data rich in depth and context. A trained sign language interpreter supported sessions with deaf students to ensure that discussions flowed smoothly and that no participant was excluded due to communication difficulties. According to Lambert and Loiselle (2008), the combination of semi-structured interviews and FGDs enhanced the richness and diversity of the data collected.

Research sites

The research was conducted across three public TVET institutions in Manicaland Province of Zimbabwe. These were purposively selected

based on their diversity in student demographics, geographical location, and approach to inclusive education. Each institution offered engineering, agriculture, hospitality, and business studies programmes, attracting a wide range of students, including those with disabilities. The selected institutions represented varying levels of inclusion readiness. One institution had initiated inclusion practices, including employing a part-time sign language interpreter. Another had a history of admitting deaf students but lacked formal support structures and relied on ad-hoc solutions. The third institution had limited exposure to students with hearing impairments and had yet to develop any structured inclusive programming.

Data analysis

The data was qualitative and analysed using thematic analysis, which involves identifying and interpreting patterns within the dataset (Braun & Clarke, 2006). The process began with verbatim transcription of interviews and focus groups, followed by repeated readings to generate initial codes aligned with the study's objectives. These codes were grouped into broader themes such as "barriers to communication," "institutional gaps," and "peer support networks." An iterative process refined and validated the themes to ensure coherence with the research objectives and relevance to inclusive education literature. Thematic analysis suited the study's constructivist paradigm, allowing participant perspectives to shape the findings meaningfully.

Ethical considerations

Ethical integrity was central to this study. Ethical clearance was obtained from the University Ethics Committee to ensure compliance with standards for research involving human subjects, including informed consent, confidentiality, and the right to withdraw. Participants received detailed information sheets explaining the study's purpose, procedures, and their rights. Informed consent was secured through signed forms. For deaf participants, information was also provided in Zimbabwean Sign Language (ZSL) via a trained interpreter to ensure complete comprehension and voluntary participation. Confidentiality was maintained by anonymising data and using pseudonyms in transcription and reporting. Data were securely stored in encrypted folders and locked units accessible only to authorised personnel. The researcher fostered safe, respectful environments during data collection, particularly in focus group discussions where sensitive experiences were shared. Power dynamics were carefully managed to prevent coercion. Interviews were held in private, accessible locations, and participants were reminded of their right to withdraw. A trauma-informed approach guided the process, emphasising empathy, active listening, and emotional safety to build trust and openness, especially considering participants' possible experiences of discrimination or exclusion.

VI.   RESULTS

The current position (status quo) is the use of sign language in TVET institutions, the availability of human and material sign language resources in TVET institutions, and strategies to promote the use of sign language in TVET institutions.

Current position (Status quo) in using sign language in TVET institutions

The current position of the use of sign language in TVET centers varies from institution to institution. The statements below from participants support this fact:

"…Sign language is not an official language at this institution. Maybe that explains why there are no deaf students or even deaf staff members. I am not sure why, but it is what it is…" (Staff 3).

"…We once had an interpreter who used to cater to deaf students' communication needs, but then she moved to greener pastures three years ago, and since then we have not found anyone to replace her, and hence we cannot enroll deaf students at the moment due to this challenge…" (Manager 2)

"…Sign language is also used at this institution, and as deaf students, we have our interpreter, and even our lecturers can sign to some extent. Even our fellow students can communicate, making us feel acceptable…" (Focus group C student).

Availability of human and material sign language resources in TVET institutions

The availability of human and material sign language resources in TVET institutions is mentioned below.

Sign language specialists

Participants indicated a critical shortage of specialized personnel in TVET institutions. The following statements from participants reveal that:

"In most tertiary institutions, there are no special sign linguists, thus making the enrolment of Deaf people a challenge" (Manager 1).

"Our institution only has one interpreter to cater for all techvoc courses" (Staff member 1).

*"Well, like here, we deal with hearing impairment! Yes, the first thing when I go to a class where there is a hearing-impaired student, I make sure I look for, I go along with an interpreter." (*Staff member 2).

"…. Another thing … unavailability of sign language teachers. A big college like this one has no interpreter; the school is three in one, you have the commercial part, the technical part, the grammar part, and there is no sign language specialist, hence no deaf students available at his institution" (Focus group member 1).

The findings highlight a significant gap in the availability of qualified sign language specialists within TVET institutions. The shortage of trained interpreters and sign language teachers limits effective communication and creates barriers for deaf students seeking access to education. Without sufficient human resources, institutions struggle to provide adequate support across diverse technical and vocational programs. This shortage not only affects enrollment rates of deaf students but also impacts their overall learning experience and inclusion within these educational settings. These findings resonate with Liu et al. (2024) and Sawula (2018), who emphasise the need for sign language specialists in TVET institutions.

Infrastructure

Participants stated that the infrastructure available was not up to standard, and at two institutions, it was not available to cater to the deaf. This included spacious rooms free from distraction. This is shown in the following quote.

*"The rooms that the deaf use are small and not adequately furnished for the deaf" (*Staff member 2).

"We do not know what rooms the deaf use and do not know about that" (Manager 3).

The responses reveal that the existing infrastructure in many TVET institutions is inadequate to support the learning needs of deaf students. The lack of spacious, well-furnished rooms that minimise distractions undermines the effectiveness of sign language communication and overall student engagement. Furthermore, the uncertainty expressed by some managers about the facilities allocated to deaf learners indicates a lack of institutional awareness and planning for inclusive education. These findings are consistent with those of Sawula (2018), who argued that access to education for sign language users remains limited due to a lack of awareness and understanding of the necessary infrastructural requirements.

Curriculum support materials

Participants reiterated that there is a need for curriculum support materials in TVET institutions. This included language modifications in the curriculum and provision of sign language dictionaries. This is proved in the subsequent quotes:

*"The college has a provision of sign language dictionaries with basic signs to enable basic communication" (*Staff member 1).

"There is a need for curriculum modification" (Manager 3).

*"We need to use an IEP to assess each learner's performance" (*Manager 2).

"There is a need for adequate learning resources as the deaf learn through seeing" (Focus group 2).

The curriculum has been a challenge in teaching. This is because the content is cumbersome and covered within a short time. The resources

available are very few, and at two institutions, they do not have resources readily available.

Strategies in promoting sign language inclusion in TVET institutions

Participants mentioned a variety of strategies that can be used to promote access to TVET using sign language.

Participants indicated that since TVET is the panacea of economic development and unemployment, mandatory sign language inclusion in the curriculum should be prioritised to include disadvantaged groups such as people with hearing impairment. The statement by a participant below reveals this notion:

"…*The curriculum planners should prioritize a method of instruction in sign language as equally as they emphasise the use of other official languages in TVET institutions*" (Manager 2).

"*It would be good if the institution accords even us staff members the opportunity to learn sign language, even as part of in-service training, just for general communication. I feel bad when I meet a vendor who is deaf, and I fail to communicate effectively with them. That has made me realize that even if our institution happens to enroll deaf learners or employ deaf staff members, I will not be able to effectively communicate with them in cases they might require my assistance…*" (Staff member 4).

Participants indicated the need for training deaf disability experts for TVET institutions as a vital strategy towards including sign language in higher education. The following is a statement revealing this notion:

"*There seems to be a limited number of interpreters for sign language, so it is difficult to find even one for an institution. We scouted for a sign language interpreter for this institution early this year but failed to get one…*" (Manager 1).

Participants indicated the critical role of employment services and information concerning the labour market in promoting deaf people's TVET access and the use of sign language. The statement below reveals this fact:

"…*It is important for all working at any TVET institution to understand the requirements for the deaf inclusion practices to be functional at these centers. This then calls for conscientisation by providing information about current and future skills from the employment services personnel for the institutions. These may also engage in vocational assessments for candidates to identify their career aspirations and potentials*" (Staff member 5).

Participants also suggested reviewing rules and methodologies that aligned with their needs. The following statements reveal this sentiment:

"…*Being deaf, I appreciate the role of a language interpreter, but I would prefer that the lecturer knows the sign, even if not all, but enough to communicate with me …*" (Focus group A student).

"…*I suggest using more visual aids in TVET theoretical lectures. In this case, what the lecture requires students to write and what they explain will be shown visually. If the student forgets, they will refer to the written material…*" (Staff member 2).

Participants indicated the need for skills-building for the deaf through access to training courses and materials. This view is shown in the quotation below:

"*Developing one's skills through updated sign language instruction and work opportunities is essential. Furthermore, TVET courses need to be interesting enough to draw students living with deafness and motivate them to continue their studies at higher education institutions*". (Focus Group C student)

Research participants suggested that Assessment and evaluation methods used for the deaf in TVET institutions should be deaf oriented. This view is shown in the quotation below:

"…*The education assessment and evaluation methods for the deaf should be aligned to their needs, allowing them to demonstrate their capabilities through the methods of instruction and approaches used….*" (Staff member 6).

Participants mentioned that inclusion of sign language in TVET institutions requires a sectoral approach encompassing the involvement of social partners, such as organisations that represent the deaf. The statement from a participant below reveals this view:

"*There is a need for all stakeholders to recognize that disability is a cross-cutting issue and that, to make disability inclusion a reality, cooperative action across several government ministries is necessary. Even organisations for the deaf should be engaged at all levels*". (Manager 3)

Participants indicated that disadvantaged group policy, including that for people with disabilities, should be aligned with the existing international and regional legal framework in structure and implementation. Statements from participants below evidence this concept:

"…*It would be helpful if the existing TVET policies were implemented to be monitored and assessed in terms of their effectiveness in promoting TVET access for the deaf community, through sign language in higher education.* (Focus Group B student)

"…*Most TVET institutions in this province cannot enroll students who are deaf because they do not have the materials and interpreters, yet there are international, regional, and national policies advocating for the inclusion of all human beings and education for all mandate…*" (Staff member 1).

The participants' responses underscore a pressing shortage of qualified sign language interpreters and trained disability experts within TVET institutions, severely limiting effective communication and inclusion for deaf students. There is a clear call for institutional capacity building, including staff training and curriculum adjustments, to meet the specific needs of deaf learners. Moreover, participants emphasise the importance of multi-stakeholder collaboration, involving government ministries and deaf organisations, to create comprehensive and sustainable inclusion policies. Finally, aligning and enforcing existing international and national disability inclusion policies remains crucial to improving access and support for deaf students in the TVET sector. These findings are consistent with those of Sawula (2018) and Liu et al. (2024), who similarly highlighted the challenges sign language users face in accessing inclusive education.

VII.   DISCUSSION

Findings established that one of the three TVET institutions under study uses sign language as a communication medium. This implies that institutions that do not offer sign language cannot enroll deaf students. This finding concurs with a study by Sawula (2018), who found that out of 26 universities in South Africa, there were very few South African Sign Language interpreting services. Moreover, many universities send Deaf applicants away because they say they cannot provide support for these students, even if they have a unit for students with disabilities (Morgan, 2008). Furthermore, Walt (2015) argues that when institutions of higher education need to plan their intake of students with disabilities, most fall mute when considering deaf students and claim that they do not know how to provide access and support to these students.

The research findings show that most TVET institutions lacked sign language specialists, and where the specialists are available, they were overwhelmed with work. Wadesango et al. (2014) highlighted that the main resource provided to students with hearing impairment is the sign language interpreter. This is extremely valuable as it presents the sign language interpreter as crucial in providing adequate access to informational content, enhancing learning, and facilitating understanding.

Moreover, the study also revealed that the curriculum needs to be modified to meet the demands of the deaf, thus making the curriculum less rigid and more restrictive for students who are deaf. This is consistent with the previous studies. San Jose (2016) study of hearing-impaired students revealed that they are expected to perform like every other student without making language errors, even when it is obvious that providing an interpreted education does not provide learners who are deaf with exposure to any language, as interpreters provide only a rough reflection or a sketch of whatever is being interpreted. The schools do not adapt the curriculum to meet the needs of the learners who are deaf and the sign language interpreters. The curriculum adaptation potentially gives the learners adequate time for learning, which may foster understanding of concepts.

Furthermore, inadequate learning resources, accessible modified facilities, and assistive devices were reported in the findings. San Jose's (2016) qualitative study reported that the institution has expectations for these students. This entails specific ways of knowing, acting, behaving, and thinking, but the institutions have not made accommodations to meet their needs.

Research results revealed that mandatory sign language inclusion in the curriculum review of rules and methodologies in line with deaf needs should be implemented to include sign language in higher education. Similarly, Tsuladze (2015) revealed that task performance modeling and demonstration were preferable teaching and learning methods for the deaf.

Tsuladze (2015) revealed that training more deaf disability experts, such as translators, for TVET institutions would be a vital strategy for promoting TVET access by including sign language in higher education. This finding concurs with Tsuladze (2015), whose study established that the interpreter's function was essential to involve students in learning and transfer oral material to them. Moreover, Foster et al. (1999) also found that deaf students' communication was primarily tied to translators rather than teachers compared to their hearing peers. Deaf students emphasised the significance of efficient communication with interpreters more than they did with their teachers to obtain learning materials.

The role of employment services and information concerning the labour market in promoting deaf people's TVET access through providing information about current and future skills from the employment services is another finding of the current research study. Similarly, Molosiwa and Mpofu (2017) indicated that giving the disabled access to TVET training is a critical first step toward their empowerment. However, access alone would not help much if it does not provide the necessary assistance for them to build the skills needed for social and economic integration.

Review of rules and methodologies in line with deaf needs is another finding from the current research study. This finding concurs with that of Moswela and Mukhopadhyay (2011), who found that university students in Botswana recommended the provision of sign language interpreters, extra time to complete work, and other needs of students with disabilities.

The study's findings also revealed the need to focus on the key building blocks of the skills system. This finding is similar to that by Tripney and Hombrados (2013), who found that marginalized young people, including those living with deafness, particularly in developing countries, are more likely than their able counterparts to lack the skills required in the labour market. Furthermore, there is a consensus that Technical and Vocational Education and Training are key in expanding opportunities for marginalised young people (Murgor et al., 2014).

A sectoral approach to TVET access for the deaf is another finding from the current research. On the same vein, research by Sawula (2018) established that TVET universities must collaborate with stakeholders to determine the skills requirements specific to the deaf or to link courses with employment prospects to facilitate their transition to work post higher education.

Lastly, the findings revealed that TVET policy in line with the deaf should be implemented, assessed, and evaluated to promote sign language use and empower them to access TVET education. This is like one that found that embracing the marginalised in TVET needs more attention through more studies or developing TVET policies and initiatives addressing the equity issue (UNESCO, 2021).

VIII.   CONCLUSION

This study's findings highlight significant challenges TVET institutions face in effectively using sign language as a communication medium for deaf students. Institutions lacking sign language capabilities cannot accommodate learners with hearing impairments, thereby widening the skills and learning gap between students with and without disabilities. If inclusive education is to be realised in practice, deliberate and systemic efforts must be undertaken to mainstream sign language across all facets of teaching and learning.

A critical shortage of qualified sign language personnel within TVET institutions was identified. Therefore, targeted training programs should be implemented to develop more educators and interpreters proficient in sign language. This will ensure effective communication and comprehension during instruction and support learners' full participation in the educational process. Additionally, training disability specialists with expertise in deaf education should be prioritised as a strategic measure toward integrating sign language into higher education.

Furthermore, there is a pressing need to upgrade the infrastructure of higher and tertiary education institutions to accommodate students with disabilities. Facilities must be equipped with assistive technologies and resources that support learners and educators, recognising that using sign language requires specialised tools and training. Incorporating modern e-learning technologies can also promote inclusive and flexible learning environments, particularly for students with communication barriers.

On a policy level, governments must implement legislation mandating the inclusion of sign language at all levels of education. Given TVET's central role in driving economic development and addressing unemployment, integrating sign language into the curriculum would help ensure that disadvantaged groups—especially individuals with hearing impairments—are not left behind. Such initiatives require robust government support and investment to be fully realised.

Moreover, national disability policies and regulations should be harmonised with existing international and regional legal frameworks to ensure consistency and effective implementation. Persons with disabilities must be afforded equal legal capacity and access to education, healthcare, family life, and civic participation. Any policy or procedural barriers limiting these rights must be systematically eliminated.

Finally, TVET and other educational institutions must actively support students with disabilities by embracing Zimbabwean Sign Language, Braille, augmentative and alternative communication systems, and other accessible formats according to learners' preferences. This commitment to accessibility will foster genuine equality and equity in educational access and outcomes following the United Nations Sustainable Development Goals.

IX.   CONFLICTS OF INTEREST

There are no conflicts of interest in this study.

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