VIRTUAL SIGN LANGUAGE INTERPRETATIONS IN OPEN AND DISTANCE EDUCATION: A PROBE INTO 'ENABLERS' AND 'CONSTRAINTS'

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ABSTRACT

In line with the philosophy of inclusion and various legislative instruments which encourage 'education for all', ODL institutions have made provision for sign language interpreters (SLIs) to facilitate participation for deaf students. Although, some studies have examined issues of virtual learning and the ODL programme; a paucity of studies assessing virtual sign language interpretation (VSLI) in remote educational activities is evident. Therefore, a research study was instituted to probe into perceived enablers and or constraints of providing VSLI during the Covid-19 lockdown in Nigeria. Based on the Job Demand Resources Model, two research questions were raised and answered in this paper. This study adopted the qualitative research design and seven SLIs who had participated in virtual teaching and learning activities during the lockdown were purposively selected to participate in the study. Semi-structured interviews were used for data collection, and the data collected were coded and analysed thematically through using an iterative process. Government policies and the empathetic nature of SLIs were found to be enablers of VSLI, while four themes, namely epileptic power supply; internet connectivity; lack of institutional support and the comprehensibility of deaf students who attended remote lectures were found to serve as barriers to effective and efficient VSLI. Based on the findings, appropriate recommendations were made.

Keywords: Virtual sign language interpretation, sign language interpreters, open and distance education, deaf students, online learning, Covid-19.

INTRODUCTION

For more than three decades, open and distance learning has continually evolved based on the need of learners and changes in various means of education deliverables such as through correspondence (Bower & Hardy, 2004; Caruth & Caruth, 2013) or through digital means (Sari & Nayir, 2020). Distance education is described in this study as a form of teaching and learning process whereby the teacher/tutor/facilitator or lecturer, as the case may be, is far away from the student(s) while communicating ideas, knowledge or educational instructions through various means, such as correspondence and other audio-visual means (radio, television and or internet-enabled computers). The foregoing implies that in distance education both the instructor and students are physically apart (Mdakane, Ngubane, & Dhlamini, 2022; Pregowska, Masztalerz, Garlinska & Osial, 2021), while communication between them is modulated through media agreed on. According to Adigun (2022); Shahabadi and Uplane (2015), distance education can be achieved either through synchronous (real-time) and/or asynchronous (recorded) models. In the current study, open and distance education was construed to mean virtually interpreted university lectures with deaf students as participants.

Interestingly, prior to the emergence of Covid-19, both models (synchronous and asynchronous) had been fully deployed in open and distance learning globally. However, the advent of Covid-19 further encouraged the application of technologies for the continuation of instructional deliveries (Adigun, 2022) to all students, irrespective of the mode of learning they had registered pre-Covid-19. In other words, all learners, those with disabilities and without disabilities, had been compelled to participate in remote education during the Covid-19 lockdowns (Adigun, 2022; Adigun, Nzima, Maphalala, & Ndwandwe, 2022). Hence, despite their loss in the sense of hearing and limited opportunities for incidental learning, deaf students participated in remote teaching and learning processes through internet-enabled devices. For the purpose of this study, deaf students represent those students with varying degrees of hearing loss whose hearing disabilities become evident when there is need for two-way verbal communication. In other words, their sense of hearing is non-functional to perceive auditory signals; and they therefore communicate through sign language (SL). Adigun (2019) asserts that sign language (SL) is a visual-spatial language which makes use of a combination of facial expressions, body movements and gestures to communicate ideas, feelings and emotions among deaf people and between deaf and non-deaf people. As a visual-gestural modality-enhanced language, sign language relies on combining hand and facial movements around the upper torso. While the deaf actively utilise sign language, some non-deaf individuals have learnt the art of signing and are certified sign language interpreters (SLIs) who serve as conduits for exchanging oral information between deaf and non-deaf people who do not use or understand sign language (Adigun, 2019).

Since the population of deaf students at higher education sector, is rapidly increasing (Mitchell & Karchmer, 2006), inclusive educational policies have enforced the employment of SLIs who serve to interpret lectures to deaf students during various university or college teachings (Marschark, Sapere, Convertino, & Seewagen, 2005; Napier, 2004). Some existing studies have shown that SLIs in educational spaces are constantly faced with various endemic challenges which include, but are not limited to, controversial role issues in the workplace to the sociolinguistic view of deaf students (Hale, Valero Garces & Martin, 2008; Witter-Merithew, 1999); the value placed on sign language interpreting profession; (Adigun, 2019; Hall, Hall, & Caselli, 2019), vicarious trauma; (Kilpatrick, 2016) and musculoskeletal diseases and mental health challenges experienced by SLIs (Adigun, 2019; Jimenez-Arberas & Diez, 2022; Napier, Skinner, & Turner, 2017). Conversely, since scanty research evidence on educational sign language interpreting has emerged from Nigeria, this study was aimed at the following:

- To assess 'enablers' and 'constraints' of virtual sign language interpretations (VSLI) in open and distance education as it occurred during the Covid-19 lockdown in Nigeria.

Research Question

The overarching research question of this study was:

What are the **(i)** enablers and **(ii)** constraints of VSLI during the Covid-19 lockdown in Nigeria?

LITERATURE REVIEW

Sign Language Interpretation in Nigeria: Situation Report

Sign language interpretation in Nigeria has a long-standing history like the history of the deaf in Nigeria. In other words, it is difficult to separate the history of SL in Nigeria from the history of deaf education. The population of deaf people in Nigeria comprising about 10 million, (Adigun et al., 2022; Mba, 1995; Treat, 2016) have developed and used the Nigeria SL to communicate with one another. Although, there is an extended variation in SL used by deaf people in Nigeria, the variation is informed by language and cultural differences of the three major ethnic groups in Nigeria: Hausa, Igbo, and Yoruba (Gbolahan, Osinaike, Udoye & Olawole, 2019) and that of about 250 other minor ethnic groups in the country (Asonye, Emma-Asonye & Edward, 2018). Regrettably, despite the huge population of deaf people in Nigeria, there is still not an established sign language interpreter training institution that provides accreditation for professional SLIs. While there are few post-secondary institutions training professionals for persons with special needs (Adigun, Hlongwane & Isaiah, 2021; Eni-Olorunda, 2005), there is not a single institution that awards

a degree or diploma certificates in SL interpretation studies, only deaf education. Powell (2013) echoed a similar situation in New Zealand of "no interpreter-training program focused on the post-secondary level exists in New Zealand".

Over the years, graduates of deaf education at various Nigerian institutions of higher learning and or families/friends of the deaf have developed and used sign language for communication purposes. The foregoing is further expressed by two different associations of sign language interpreters in the country: (i) the Association of Sign Language Interpreters of Nigeria (ASLIN; https://aslin.org.ng/), and (ii) the Educational Sign Language Interpreters Association of Nigeria (ESLIAN; https://eslian.org/default.aspx#home). The foregoing implies that while higher educational institutions in Nigeria have appointed sign language interpreters for deaf students, the criteria for such appointments have always been a degree or certificate in deaf education. While SLIs in Nigeria had no regulated SLI certification, they have constantly developed their interpretation skills through extended communication and interactions with deaf people who sign, using a mixture of American and Nigerian Sign Language.

Virtual Sign Language Interpretation During Covid-19: Enablers and Constraints

Although, receiving SL communication via digital media, such as television, has long been in existence prior to the emergence of Covid-19 (Adigun, Mosia, & Olujie, 2022; Gokce, 2018), receiving SL-interpreted lectures through internet-enabled computerized devices was a new and sudden phenomenon experienced by many Nigerian deaf students in higher education spaces during the Covid-19 pandemic. However, while lectures continued remotely during the pandemic as a measure to curtail the spread of Covid-19, deaf students were encouraged to join virtual (synchronous and asynchronous) classes which were mostly conducted through video-enhanced internet-enabled platforms such as 'Google Classroom', 'Google Meet', 'MS Teams', 'Skype', 'Webex' and 'Zoom' among others (Adigun, 2022; Alshawabkeh, Woolsey & Kharbat, 2021; Williams, 2021). Available evidence showed that, due to restrictions to physical interaction, there was a spike in the adoption and usage of Zoom for academic activities and other engagements (Williams, 2021). Interestingly, the introduction of sign language-enabled features on Zoom increased its use for academic engagements and remote discussions that involve deaf people and contributed to the deaf community increasingly using Zoom (See figure 1). In other words, online academic engagements further involved the use of virtual remote sign language interpretation (McKibbin, 2021)

Figure 1: Picture-in-picture of a female Chinese Sign Language Interpreter interpreting during a Zoom meeting. (Source: https://support.zoom.us, 2023).

While many existing studies lauded the remote continuation of academic sessions (Lynn et al., 2020), other researchers affirmed that remote education, especially for students with disabilities, was equally challenging for both students and facilitators, such as lecturers and SLIs (Adigun et al., 2022; Mathews, Cadwell, O'Boyle, & Dunne, 2022; Safirista, Murtadlo, & Pudjisartinah, 2022). In their study, Alqraini & Alasim (2021), Lynn et al. (2020) remarked that active participation and the enrolment of deaf students in distance education has increased since the emergence of Covid-19. Although Lynn et al. (2020) agreed that deaf students have diversified communication preferences or a style with uneven digital literacy skills, a swift transition to online classes have fostered the digital dexterities of not only the students, but also that of faculty members and support staff, such as SLIs. Online learning during the period of lockdown motivated institutional commitments to the development of various learning management systems that promote real-time learning engagements (Newbold, 2018; Lynn et al., 2020). As indicated by Lynn et al. (2020) deaf students have expanded access to real-time sign language interpretation of lecture series through the Zoom screen-sharing features. In other words, SLIs are virtually available to assist deaf students during remote classroom instructions. In fact, a study by Lynn et al. (2020) revealed that during Covid-19 lockdowns remote teaching, SLIs at the National Technical Institute for the Deaf (NTID) were assigned a window on the learning interface which gave deaf students clear access and visibility to interpreted lectures.

Besides the prevention of local transmission of Covid-19 and stakeholders' efforts of limiting the rate of exclusion of students with disabilities during remote/distance education during the pandemic, Studies affirmed that teachers of deaf students and other relevant professionals, such as SLIs, struggled with various challenges in ensuring effective inclusiveness of education for all (Adigun, 2022; Adigun & Ntokoza, 2022; Alqraini & Alasim, 2021; Alshawabkeh et al., 2021; Baroni & Lazzari, 2020; McKibbin, 2021; Safirista et al., 2022). Although, there is a dearth of research evidence of SLIs who interpreted remotely during Covid-19, there are a few available studies, such as De Meulder, Pouliot and Gebruers (2021), Halley, Wessling and Sargent (2022) and McKibbin (2021). De Meulder, Pouliot, and Gebruers (2021) in their multi-country study of remote SL interpreting during the pandemic, revealed that Zoom was one of the most frequently used platforms among various video-conferencing platforms.

Studies by De Meulder et al. (2021) and McKibbin (2021) revealed that virtual SL interpretation was a new engagement for many of their respondents. According to De Meulder et al. (2021) and McKibbin (2021), many SLIs were compelled to engage in remote SL interpretation. Unfortunately though, the academic community and everyone in general was not prepared to witness a quarantine period of such a magnitude. Hence, SLIs had limited support systems and technical capacities to actively and efficiently discharge their duties remotely. Adigun (2019) stresses the negative impact of the lack of training and re-training of SLIs, especially those SLIs who work in the educational system. As stated by Adigun (2019), the duties of SLIs are associated with extended levels of job stress, burnout and ergonomic hazards. In support of Kumar, Saini, Roy and Dogra (2018), Qin, Cheng, Tang and Bian (2014) as well as Schwenke et al. (2014), Adigun (2019) further echoed the potential negative effect of job pressure; and the mismatch between working conditions and training. Unfortunately, published evidence among SLIs who interpreted remotely showed that SLIs were overwhelmed with remote interpreting jobs and how to cope with the demands of families at home (Alqraini & Alasim, 2021; De Meulder et al., 2021, Halley et al., 2022; McKibbin, 2021).

Previous studies revealed that faculty members/academics/support staff members, especially those from some African nations, lack sufficient potential for web-based pedagogies and their usability of video-conferencing platforms is not optimal (Maphalala & Adigun, 2021; Panyukova & Sergeeva, 2019; Sife et al., 2007). Among some stated challenges to effective and efficient two-way interaction via video-conferencing tools, Maphalala and Adigun (2021); Halley et al. (2022); Koustriava (2022), and McKibbin (2021) aver that not only students experience technical difficulties in using various internet-enabled devices for virtual learning. In fact, De Meulder et al. (2021); Maphalala and Adigun (2021) and McKibbin (2021) expressively indicated that faculty members and other e-learning facilitators at various times indicated extensive challenges with technical glitches, and most of the times there was no immediate technical support. Lamentably, a volume of other studies has shown that remote education in the African sub-region is greatly hampered by epileptic power supply and unreliable internet connectivity. Although SLIs who participated in the studies of De Meulder et al. (2021), Halley et al. (2022) and McKibbin (2021) did not complain about electricity challenges, they were overwhelmed by financial challenges; and many indicated a lack of suitable workplace and equipment as well as technical glitches.

Alsadoon and Turkestani (2020), as well as Alqraini and Alasim (2021) alluded those professionals working with deaf students were discouraged by language competencies of deaf students and their potential to comprehend academic instructions during remote/virtual teaching and learning sessions. Alqraini and Alasim (2021) noted that deaf children's interest in learning is diminished during remote learning due to a lack of adequate comprehension. In fact, Williams (2021) and Lynn et al. (2020) asserted that deaf students are highly susceptible to 'Zoom' fatigue during remote interpreting sessions. Lamentably, despite the 'high' population of deaf people in Nigeria, their academic engagements were greatly affected during the pandemic (Adigun et al., 2022). It is quite disappointing that there is yet empirical evidence on sign language interpretation for deaf students during the lockdown in Nigeria. Therefore, it is believed that the current study which explored the 'enablers' and 'constraints' of VSLI in open and distance education, as it occurred during the Covid-19 lockdowns in Nigeria, will not only provide new knowledge in remote sign language interpretation, but will also enhance professional development of sign language interpretation globally.

THEORETICAL FRAMEWORK

The Jobs Demands Resources Model (JD-R) by Dean and Pollard (2001) is used to frame this study. JD-R assume that there are two distinctive job characteristics: job demands (physical and psychological demands); and job resources (functional factors/variables that aid the smooth transition of an employee towards an overall achievement of organizational goals) in every context of work (physical or remote). Demerouti and Bakker (2022) have drawn the attention of research on the implication of JD-R for understanding employees SLIs, in this case, can best deal with the traumatizing impact of the pandemic and how they are coping with other workplace crises which may arise from resources to aid effective functionality. According to Adigun (2019), the schedule of SLIs is so demanding that it has a negative impact on their mental health. Adigun (2019; 2020) and Powell (2013) assert that SLIs are prone to job stress and burnout, even during face-to-face interpreting. They work under pressure to keep up with the speaker while ensuring that their deaf client does not miss out on any slight information. In other words, their job control ability is minimal since their functionality is dependent on the speed at which the speaker speaks and or clarity of the speakers' speech. Regrettably, it is assumed that while SLIs may have significant challenges when interpreting in a face-to-face meeting, virtual interpreting may exert more pressure on SLIs. It is assumed that resources required for their job and the perceived inadequacy of comprehensibility of their client may increase the apprehension of SLIs interpreting virtually during the Covid -19 lockdowns.

METHOD

Study Design and Setting

This study adopted a qualitative research design, using the interpretive paradigm to explore enablers and constraints of virtual sign language interpretation in open and distance education in Nigeria. The qualitative research design was considered appropriate mainly because the research design allows for the exploration of phenomena in its natural environment. According to Astalin (2013), such research design provides a researcher with the opportunity of dealing with research concerns based on aspirations, attitudes, beliefs, motives and values in relation to physical and social interactions. Also, we adopted the qualitative research design and the interpretive paradigm because of its strength through a systematic inquiry method to provide an understanding of phenomenological concepts as advanced by Adigun and Mngomezulu (2020), and Creswell (2013). In this study, virtual sign language interpretation in Open and Distance Education was the phenomenon of interest.

Two publicly funded institutions of higher learning from Oyo State, Nigeria were purposively selected for the study. The two institutions were purposively selected based on the availability of deaf students and sign language interpreters who participated in remote teaching/sign language interpretation during the Covid-19 pandemic. The study sampled seven SLIs who engaged in online sign language interpretation to deaf students, using a purposive sampling procedure. The recruitment of study participants was conducted through WhatsApp messaging and telephone calls. Participants who met the inclusion criteria of this study were those who:

- were members of the Educational Sign Language Interpreters Association of Nigeria (ESLIAN);
- were permanent staff of the institution with at least five years of work experience;
- were willing to voluntarily participate in the study.

Data Collection

An interview guide was developed by the researchers for the purpose of data collection. The interview guide covers some semi-structured interview questions such as:

- Have you engaged in VSLI prior to the lockdowns occasioned by COVID-19?
- Did you receive any training from your institution prior to VSLI engagements?
- Did you receive any support from your institution toward the VSLI during the lockdowns?
- If yes, what kind of support?
- How long have you been in the Sign Language interpreting profession?
- How would you describe your experience of virtual sign language interpretation (VSLI)?
- What are the opportunities presented by VSLI?
- What are the potential challenges presented by VSLI?

Data collection was further conducted through semi-structured voice-recorded telephonic interviews with each participating SLI between 21 August 2022 and 17 September 2022. Owing to the lockdown during the time of data collection, the authors were not able to have a face-to-face interview, but the researcher ensured flexibility of questioning and responses during the interview process in line with qualitative research interview protocol (Cohen et al., 2011: 201). In other words, the interviewer allowed a free flow of interview session as respondents were given ample opportunities for expression. Each interview session lasted for about 30 minutes.

Data Analysis

A transcription of the audio-recorded, semi-structured interview was conducted, using Microsoft Word. The transcription was done verbatim by two different translators employed by the researchers. The transcribed document was checked and rechecked alongside with the audio-recorded, semi-structured interview after which the transcript was systematically coded to ensure the anonymity of the study participants. Participant identities were anonymized by using pseudonyms, such as SL1 to SL7 (which comprised three males and four females) to ensure confidentiality and protect the identities of the participants. Afterwards, the anonymized coded transcript was thematically analyzed, as indicated by Cohen et al. (2011). A thematic analysis was conducted to identify recurring themes which were used to further deal with and provide answer(s) to the research questions raised in the study. We ensured and strictly followed the iterative process (Astalin, 2013) of the analysis for comparison and summarization of collected data collected to arrive at a conclusion strictly aimed at answering the research questions.

Ethical Consideration

All ethics of humanities and social science research were observed in this study, as stated in the *Declaration of Helsinki.* Prior to the collection of data, the sample voluntarily participated in the study. English was used as a medium of communication during the interview process. The confidentiality of participants and their responses was assured.

RESULTS

Seven SLIs, who worked remotely to virtually interpret to deaf students in a Nigerian university during the Covid-19 lockdown, participated in the study, four of which were females, others were males. Just one of the participants had work experience of five years and 2 months, while the highest years of work experience was

about 17 years. Three out of the seven SLIs had a college certificate (the Nigeria Certificate of Education) in deaf education, three had a bachelor's degree in deaf education and the others had a master's degree in deaf education respectively (See Table 1 for further information on the participants).

Table 1. Demography of the study participants

Participants characteristics		Frequency (%)
Gender	Male	3 (42.9%)
	Female	4 (57.1%)
Years of work experience (years)	1 – 10	1 (14.3%)
	11 and above	6 (85.7%)
Educational Qualification	Nigeria Certificate in Education (Special)	3 (42.9%)
	Bachelor's degree	3 (42.9%)
	Master's degree	1 (14.3%)

In response to the main overarching research question in this study, which sought to determine (i) enablers and (ii) constraints of VSLI during the Covid-19 lockdown in Nigeria, the following themes in table 1 emerged.

Table 2. The themes associated with each concern of the study

Variable	Themes
Enablers of VSLI during Covid-19	Government policies
	Empathy
Constraints of VSLI during Covid-19	Epileptic power supply
	Internet connectivity
	Lack of institutional support
	Comprehensibility

Enablers of Vsli During the Covid-19 Lockdown in Nigeria

Government Policies

Government policies emerged as the first theme that enabled VLSI during the lockdown. No one was prepared for the emergence of Covid-19, which led to a high mortality rate in the first three months after Covid-19 had first been detected. To curb or control the community spread of the deadly virus, the government of Nigeria, as done by other nations, enacted various policies, such as the total lockdown of the country to stem the tide of the spread of Covid-19 (Adigun et al., 2022). The policy affected all sectors and essentially led to the closure of basic primary and post-secondary institutions. Participants in this study noted that the policy influenced the need to participate in remote/virtual SL interpretation for deaf students. In support of this assertion, SLI 6 said the following:

> *Since the government declared the lockdown as a measure to combat the spread of Covid-19 and the academic calendar was asked to continue remotely, the sing language interpreters had no choice than to continue our interpreting activities online.*

Also, SLI 2 added that:

> *The participation of deaf students in online classroom activities compelled sign language interpreters in the university to engage in virtual interpreting.*

SLI 7 further corroborated SLI 2. SLI 7 by adding the following:

> *Of course, prior to Covid-19, no one was doing online interpreting until the online classes began during the lockdown. I had no choice but to participate since it is the University's decision.*

As indicated by the SLIs who participated in this study, the lockdown by the emergence of Covid-19 and decision and or regulation of the University system to move academic activities to virtual platforms propelled virtual sign language interpreting for them. In other words, one of the conditions that served as enablers of VSLI in Nigeria was government and organizational policies.

Empathy

"*Empathy"* is a concept generally used to refer to an individual's ability to emotionally understand the feelings of other persons; and perceive issues from the point of view of other people, while putting oneself in their position. This study further showed that the participants in this study were concerned about the plights of deaf students who were members of remote classes. Below are some extracts from the scheduled interview with the participants:

SLI 1 commented as follows:

> *I usually have pity for deaf students because they miss out on so many occasions on issues that relate to academic discourses. In some instances, they get the required information very late. Therefore, when classes were being conducted virtually, my concern was how well the deaf students will be able to cope. But I did my best during the remote interpreting.*

According to SLI 1, her concern for academic wellbeing and wholesome inclusion of deaf students makes her more passionate about her engagement in VSLI during the Covid-19 lockdown. In a similar vein, SLI 5 shared the same sentiment as SLI 1:

> *I strongly believe that the academic performance and or learning outcomes of deaf students in the University are relatively proportional to my service as a sign language interpreter. So, I believe that my job is crucial for the survival of deaf students. Therefore, I will say that my participation in the virtual class was because I feel they will miss out of much cogent information if a sign language interpreter is not available in an 'online' class.*

SLI 4 added that:

> *Although we (SLIs) in the university were not compelled to engage in remote interpretation because of the supposed unavailability of required support, most of us did have engagements with the students (deaf students) because of our passion for their growth and learning outcomes. Specifically, I (SLI 4) strongly want deaf students to excel in their studies.*

SLI 3 further noted that:

> *Even though deaf students have access to transcriptions during their classes on Zoom, I believe that having such online classes interpreted would be the best for them. That is my main reason for joining and interpreting the virtual classes during the lockdown.*

Besides the fact that government and organizational policies fostered remote teaching during the lockdown, SLIs passionately engaged in VSLI to deaf learners. The findings showed that SLIs were not only passionate about the job but were also very much concerned about the educational plights of deaf students who participated in virtual teachings during the lockdown in Nigeria.

With reference to the *constraints that militated against effective and efficient VSLI during the Covid-19 lockdown*, four themes (epileptic power supply, internet connectivity, lack of institutional support, and comprehensibility) were generated.

Epileptic Power Supply

The participants in the study expressed their dissatisfaction with the epileptic nature of electricity in their respective areas. According to them, they submitted that irregular availability of electricity hampered their virtual sign language interpreting activities. In support of the foregoing, SLI 6 said:

> *I must say that the lack of electricity frustrated my effective participation in remote interpreting. There was always a power failure, and I cannot be using a generator (Alternative power supply) to power the house so I can have my laptop charged.*

Also, SLI 4 remarked that:

> *The lack of electricity frustrated my efforts at efficiently interpreting remotely during the lockdown. It was very challenging to engage in a virtual interpreting service when you are not sure if you will be able to complete an interpreting session.*

SLI 2 echoed similar concerns about the issues of epileptic power supply. SLI 2 stated that:

> *The regular supply of electricity is a strange phenomenon in my suburb. Sometimes, when we have about four to six hours of constant supply of electricity, it is like a blessing. So, lack of electricity was a major issue to active participation in remote teaching that involved sign language interpreting during the lockdown.*

As indicated by the participants of this study, even with their passion for an unhindered deaf education, their effort to effectively engage in VSLI was hampered by the irregular power supply. In other words, the lack of constant electricity was a disadvantage to the achievement of efficient VSLI during the Covid-19 lockdown that precipitated the virtual education of all Nigerian students.

Internet Connectivity

It is undeniable to say that the availability of fast and reliable internet connectivity is directly proportional to the perceived level of satisfaction derived from a virtual learning environment. In other words, reliable internet connectivity is paramount for two-way (tutor-students/students-tutor) successes during remote teaching and learning processes. Regrettably, the participants of this study vehemently frowned on the state of internet availability and connectivity in their respective areas. With reference to the foregoing SLI 1 stated that:

> *Internet connectivity was a serious challenge for me even as I tried to actively engage and interpret deaf students remotely. It was very frustrating not only for me as I was interpreting virtually but also for the lecturer and deaf students.*

SLI 1 continued:

> *You can imagine how frustrating that there is a delay in receiving the content of the lecture on my side and no network issue on the side of the deaf students or network difficulties on the side of the student while I have continued signing only for the student to send you a message that you should repeat what you have said. Imagine how frustrating that can be.*

SLI 1 stated that speaking was very uncomfortable with the state of internet connectivity, while engaging in VSLI during the lockdown. In relation to the statement of SLI 1, SLI 5 also said that:

> *It is very challenging and demanding to engage in remote interpreting in Nigeria. Internet connectivity can be frustrating. I can remember during the remote sign language interpreting sessions, I had to recharge each of my two Sim cards. I usually switch from one to another to have access to regular internet services.* (A SIM (Subscriber Identity Module) card is a plastic piece with a circuit-embedded chip that stores identifying information on a mobile device.)

SLI 7 did not only complain about the dwindling availability of internet access and speed of internet connectivity, but also about the cost of internet connectivity. SLI 7 noted that:

> *Despite the fact that the internet was so slow and made remote interpreting very difficult, the cost of recharging data was high. I must say that remote interpreting was a herculean task during the lockdown. As for me and some of my colleagues, it wasn't an enjoyable activity. Internet connectivity messed it up.*

All the participants in this study were not comfortable with the state of internet accessibility and usability for the purpose of conducting remote sign language interpreting activities. They noted that internet accessibility was poor with low bandwidth, slow internet speed, and the high cost of internet made VSLI during the Covid-19 lockdown a major challenge.

Lack of Institutional Support

The participants detailed their regrets about the lack of support of any form from their institution. Some participants indicated that they were not reimbursed for the costs of data bought for the purpose of remote sign language interpreting. SLI 2 said that:

> *Since I joined the university, there has not been any special training for sign language interpreters not to talk of preparing us (sign language interpreters) for digital interpreting.*

SLI 6 buttressed the statement of SLI 2:

> *Sign language interpreters who worked remotely with deaf students did it based on humanity and empathy. The university did not provide us with laptops or the Internet.*

SLI 3 added the following:

> *Each one of us sources the gadgets and the Internet by ourselves. No special allowance was paid for the service.*

The participants in the study were upset about by the lack of support and concern of their institution. They indicated that they did not receive any form of support from their institution for virtual/ remote interpreting before, during and after the Covid-19 lockdown in the country. Hence, they felt that the lack of required support from their institution discouraged them from giving their best for virtual sign language interpretations during remote teaching for deaf students.

Comprehensibility

Sign language interpreters are usually concerned about how well their clients can comprehend what is being communicated to them through sign language. Interestingly, the foregoing was the concern of the participants in this study. For instance, SLI 5 indicated the following:

> *My major concern while interpreting virtually during the cause of various online lectures which took place during the lockdown was how well the deaf participants will understand me at the other end.*

SLI 2 shared the following concern:

> *The ability of deaf students to adequately comprehend interpreted classes was my major headache. The fact that the Internet was disturbing the easy flow of discussion added to my anxiety about how well deaf students were able to follow the lecture series and understand interpreted messages.*

Another participant, SLI 4, said:

> *I always have deaf students come back to me through WhatsApp to re-explain some concepts to them even after the lecture is long finished. This was because they would say, they couldn't see well what I interpreted or there was an Internet glitch among other factors that prevent them from easily grasping of interpreted concepts.*

SLI 7 also submitted that:

> *I am very concerned about the level of fatigue experienced by deaf students who are seated behind the computer for hours. I strongly believe that their attention span is always threatened by long hours of watching interpreted lectures.*

The findings showed that the participants were worried about the level of comprehension and how well deaf students who participated in virtual learning could understand the interpreted lectures. The concern of the participants was intensified by the reoccurrence of technical/internet glitches, the attention span of deaf students and perceived fatigue because of extended hours of focus on virtually interpreted lectures.

DISCUSSION

The philosophy and principles of inclusive education (McDermid, 2020; Thoutenhoofd, 2005) have encouraged the appointment of educational sign language interpreters at various institutions of higher learning (Marschark et al., 2005; Napier, 2004; Powell, 2013). Although, it may be convenient to assert that none of the institutions of higher learning that appointed educational sign language interpreters were

prepared for the engagement of SLIs in virtual interpreting, like during the lockdown occasioned by Covid-19 in Nigeria. However, while the pandemic lasted and lockdown measures were implemented as a measure to curtail the spread of the virus, educational activities continued, especially at various institutions of higher learning in the form of virtual teaching. Interestingly, Nigerian higher educational institutions were not left out of virtual teaching (Adeyanju et al., 2022). Hence, the involvement of SLIs who engaged in VSLI. However, concerns were raised about factors that hampered VSLI, but no research evidence has yet shown factors that motivated or hampered VSLI in Nigeria. Hence, this study presented qualitative evidence of 'enablers' and 'constraints' of virtual sign language interpretations (VSLI) at an open and distance education, as it occurred during the Covid-19 lockdown in Nigeria.

Based on the Jobs Demands Resources Model (Dean & Pollard, 2001), as a theoretical framework, the findings of this study showed that there are two major factors: government policies and empathy that encouraged the participation of SLIs in remote interpreting for the duration of the lockdown. The findings of this study on government policies have been echoed by a plethora of past research. For instance, Adeyanju et al. (2022); Adigun (2022); Adigun et al. (2022); Alqraini and Alasim (2021); Alshawabkeh, Woolsey and Kharbat (2021); Baroni and Lazzari (2020); Williams (2021); Lynn et al. (2020); Mathews et al. (2022); McKibbin (2021); Newbold, 2018, and Safirista et al. (2022) were among existing studies that attested to governmental intervention curbing the tide of Covid-19 and its potential influence of community transmission. To halt or curtail the negative impact of Covid-19 on the human population and other relevant sectors, like many other countries, among others, Canada, Nigeria and South Africa Alqraini and Alasim (2021) stated that the government of Saudi Arabia also placed the country in lockdown. As stated by Adeyanju et al. (2022), the lockdown occasioned by Covid-19 encouraged he use of digital media by Nigerian Universities for teaching and learning purposes. In other words, the proclamation of the lockdown measure in Nigeria and educational stakeholders' measure to salvage the academic calendar cumulated in having virtual classes that were also attended by deaf students.

Although, the argument of Adeyanju et al. (2022) was that Covid-19 further promoted distance education existing studies have shown that government policies have for a long time favored open and distance education in Nigeria and beyond (Bower & Hardy, 2004; Caruth & Caruth, 2013; Mdakane et al., 2022; Pregowska et al., 2021; Sari & Nayir, 2020; Shahabadi & Uplane 2015). One of the expositions of this study was that government policies on the lockdown engaged the entrants of SLIs into remote open and distance education whereby they had to interpret to deaf students who participated in virtual learning. Although there is a dearth of existing studies, especially from Nigeria, that have provided such a report study, Napier, Skinner and Turner (2017); and Skinner, Napier, and Braun (2018) in the United States have earlier exposed the role of SLIs in remote interpreting with positive results leading to active engagements of deaf people. Our study further confirmed that, apart from the fact that government and institutional policies influence the engagement of SLIs in virtual education, SLIs also empathized with deaf students who participated in remote teaching, despite the challenges associated with sign language interpreting (Adigun, 2019; Hall, Hall, & Caselli, 2019; Hale, Valero Garces & Martin, 2008; Jimenez-Arberas & Diez, 2022; Kilpatrick (2016); Napier, Skinner, & Turner, 2017; Witter-Merithew, 1999) our study revealed that SLIs were truly concerned about their clients, deaf people, and their access to required real-time information. In other words, they were truly empathetic about the academic success of deaf students. Unfortunately, studies of Adigun (2019); Harvey (2001); Kilpatrick (2016) and Jimenez-Arberas and Diez (2022) affirm that the empathetic nature of SLIs is a predictor of several episodes of burnout and stress, vicarious trauma; musculoskeletal diseases and mental health challenges recorded among SLIs.

Epileptic power supply and the challenges associated with quality accessibility to fast and reliable services were among the identified factors that served as constraints to quality and efficient VSLI for the deaf during the lockdown in Nigeria. Our study found great dissatisfaction with the state of electricity in Nigeria. Computer gadgets undeniably require electricity supply to function. Unfortunately, participants in our study noted that irregular electricity supply was a barrier to the achievement of efficient VSLI during the Covid-19 lockdown that precipitated virtual education of all Nigerian students. Apart from the electricity challenges, inadequate access to fast and reliable internet services were identified to negatively affect the efficient delivery of VSLI to deaf students. Participants in this study not only vehemently frowned on the state of internet availability and connectivity in their respective areas, but were also infuriated by the cost of internet data bundles.

A finding of the current study supported the results obtained in the studies of Adigun (2019); De Meulder et al. (2021); Koustriava (2022); Kumar et al. (2018); Maphalala and Adigun (2021); McKibbin (2021); Panyukova and Sergeeva (2019); Qin et al. (2014); Schwenke et al. (2014), and Sife et al. (2007). According to Adigun (2019), Kumar et al. (2018), Qin et al. (2014) and Schwenke et al. (2014), sign language interpreters are usually pressured by inadequacies of required facilities that enhance their job performances. Hence, they seem to be overwhelmed when required facilitates are lacking Alqraini & Alasim, 2021; De Meulder et al., 2021, Halley et al., 2022; McKibbin, 2021). Regrettably, earlier studies by Maphalala and Adigun (2021); Panyukova and Sergeeva (2019), and Sife et al. (2007) assert that epileptic supply of electricity and low internet bandwidth remain major challenges to successful implementation and execution of e-learning. With reference to electricity, the findings in this study did not correspond to those of De Meulder et al. (2021), Halley et al. (2022) and McKibbin (2021), whose study participants did not complain about electricity challenges, but were overwhelmed with financial issues such as a lack of suitable workplace and equipment and technical/internet glitches as many of these participants indicated.

It is quite appalling that, despite the nature of the job rendered by SLIs, they receive little to no institutional support. Participants in this study detailed their regrets about the lack of support in any form from their institution. They were not supported with regular training opportunities or a supply of fast, reliable internet data bundles for the purpose of VSLI during the lockdown. Thus, the participants believed the lack of required support from their institution discouraged them from giving their best for VSLI during remote teachings for deaf students.

It is quite appalling that, despite the nature of the job rendered by SLIs, they receive little to no institutional support. The participants in this study detailed their regrets about the lack of support in any form from their institution. They were not supported with regular training opportunities or supply of fast, reliable internet for the purpose of VSLI during the lockdown. Thus, the participants believed that the lack of required support from their institution discouraged from them giving their best for VSLI during remote teachings for deaf students. The findings of this study are like what was reported in the study of Adigun (2019) and De Meulder et al. (2021) Maphalala and Adigun (2021); Panyukova and Sergeeva (2019) and Powell (2013) who noted that various academic institutions failed to train and re-train their support staff members. Specifically, Maphalala and Adigun (2021); Qin et al. (2014) as well as Schwenke et al. (2014) aver that the lack of institutional support pose a danger to retaining professionals in the educational sectors. While Alqraini and Alasim (2021) appreciated the role of SLIs in providing interpreted teaching/lecture series to the deaf during the Covid-19 lockdown, Alqraini and Alasim (2021) frowned on the low level of technical support, training and re-training SLIs received. Powell (2013) raised concerns about the lack of adequate institutional support for SLIs and their potential abilities to perform adequately in a postsecondary teaching environment. With reference to the assumption of the Jobs Demands Resources Model (Dean & Pollard, 2001) and the findings of Powell (2013) in his study among SLIs in New Zealand, Nigerian SLIs were also concerned about the status and structure of sign language interpreting as a profession and career development (Adigun et al., 2021 & Eni-Olorunda, 2005).

The job of SLIs is not completed without adequate comprehension of interpreted messages by deaf people. Hence, the challenges faced by SLIs who participated in our study intensified their concern about the comprehensibility of a virtually interpreted lecture series during the lockdown. Our findings revealed that the comprehensibility of deaf students, as a concern, was intensified by the reoccurrence of technical/internet glitches, the attention span of deaf students and perceived fatigue because of extended hours of focus on virtually interpreted lectures. Past studies stated that SLIs who interpret remotely are usually overwhelmed (Alqraini & Alasim, 2021; De Meulder et al., 2021, Halley et al., 2022; McKibbin, 2021; Napier et al., 2017; Skinner et al., 2018). Alsadoon and Turkestani (2020) as well as Alqraini and Alasim (2021) allude that SLIs who are working remotely are always worried about the state of understanding deaf learners who are unmonitored at the far end of video-conferencing gadgets. Alqraini and Alasim (2021) noted that the source of SLIs' worry stem from the perceived language abilities of deaf students and their attention span during remote/virtual teaching and learning sessions. More so, Williams (2021) and Lynn et al. (2020) identified the possibility of Zoom' gloom and fatigue during remote interpreting sessions as factors that may threaten the comprehensibility and active participation of deaf students in remote teaching and learning activities.

CONCLUSION

The current state of education globally is attached to technology. Excitingly, the emergence of Covid-19 encouraged the adoption and use of technology, especially video-conferencing technologies for teaching and learning activities. While there is an established increase in the population of deaf students at institutions of higher learning, our study hinged on the Jobs Demands Resources Model focused the attention on the plights of SLIs through our assessment of (i) enablers and (ii) constraints of VSLI during the Covid-19 lockdown in Nigeria. This qualitative evidence concluded that government policies and the empathetic nature of SLIs were enablers of VSLI during the lockdown in Nigeria, while four themes, epileptic power supply, internet connectivity lack of institutional support, and comprehensibility of deaf students who attended remote lectures were found to serve as barriers to effective and efficient VSLI as obtained among the participants of this study.

Recommendations

While the authors of this study acknowledged the importance of government policies on education for all and educational and social inclusiveness, it is important for the government to pay attention to the sign language interpreting profession, specifically the government of Nigeria should develop policies that will promote education, training and re-training of SLIs. Postsecondary institutions should always listen and provide an immediate positive response to the needs and requirements of SLIs because they are not just a conduit for information dissemination, but also serve in the position of a 'teacher/tutor/lecturer' with the services they render to deaf students to make equitable and inclusive education accessible to the deaf population. Therefore, educational institutions should provide improved services and remuneration for the education of SLIs. There is a need for the establishment of an interpreters training program that will specifically provide recurrent training and certification for SLIs. More so, the wellbeing of educational SLIs should be prioritized at all levels of education and more focus needs to be placed on those SLIs at tertiary institutions. We advocate for extensive support for the education of SLIs. They should be adequately trained in remote interpretation, especially in the fourth industrial revolution. Lastly, through government and institutional policies, all requirements for efficiencies in virtual sign language interpretation should be made available by various institutions of higher learning that serve deaf students.

Limitations of the Study

No study is exhaustive. In other words, there are various limitations to every research endeavor. Hence, we acknowledge that our study has its limitations. For instance, we adopted a qualitative research design to interview seven SLIs who remotely interpreted lectures to deaf students during Covid-19 lockdown in Nigeria. Meanwhile, this study did not juxtapose the findings from SLIs with that of the administration of the two institutions selected for the study and also not the findings of deaf students who participated in remote teaching and learning activities during the period under consideration. Therefore, we are limited in the generalizability of the findings. Based on the foregoing, we suggest a replication of this study but the study should bridge the gap identified in this study.

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