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Original Article

Phenomenological Experiences of Students with Visual Impairment in the Use of Online Learning Platforms in Ghanaian Universities

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Abstract

In recent years, the integration of learning management systems (LMS) into the teaching and learning for regular undergraduate students has become increasingly prevalent in Ghanaian institutions. Some universities have adopted a hybrid approach to teaching and learning even after the COVID-19 pandemic. The objective of this investigation is to understand the phenomenological experiences of students with visual impairment who use LMS in Ghana. Data was collected through in-depth interviews with 11 students with visual impairment from two public universities. The findings primarily identified the accessibility successes and challenges that students encountered when using the LMS platforms, specifically Sakai and Virtual Classroom (VClass). The participants' experiences varied; students using Sakai demonstrated a more positive experience compared to those using VClass. The discrepancy in experience was primarily due to personal and institutional factors, including the absence of personal computers or supportive mobile phones; inadequate computers at the resource centres; poor internet connectivity and coverage; and the absence of periodic training for students on how to use the LMS platforms. Moreover, this study revealed some accessibility concerns for both platforms. The study recommended that e-learning platform developers should be empowered and encouraged to incorporate UDL principles to promote their use by students with visual impairment.

KEYWORDS: Online learning, e-learning, accessibility, visual impairment, higher institutions, education

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1.0 INTRODUCTION

In many respects, information and communication technology has revolutionised teaching and learning in higher education during the last three decades. Technological advancements have compelled institutions to digitally transform all facets of institutional activity (Benavides et al., 2020). Administrative operations such as electronic document creation, online meetings, and digital filing systems are examples of transformations, including direct teaching and learning transformations such as online course registration, online teaching, and online assessment of students' learning. SDG 4 emphasises inclusion and equitable quality education, which promotes lifelong learning opportunities for everyone. Universities can achieve this goal if students with disabilities are given equal opportunities to access and use LMS platforms that have become an integral part of higher education.

E-learning has gained significance in Ghanaian universities in recent years, and it has been incorporated into the teaching and learning of students undertaking sandwich, distance, and regular programmes. E-learning, according to Rodrigues et al. (2019), is an innovative web-based framework that uses digital technology and other types of instructional materials to provide students with a personalised, learner-centred, accessible, enjoyable, and interactive learning experience that supports and enhances learning processes. The ability of learners to access e-learning resources drives their use. According to Truckle (2019), e-learning accessibility means using technology and standards to ensure that instructional materials are fully accessible to all learners, regardless of their disabilities.

E-learning involves the use of learning management systems (LMS), video conferencing platforms, and social media platforms. LMS includes the use of VClass, MOODLE, Sakai, Google Classroom, and Blackboard, while Zoom, Google Meet, YouTube Channel, Microsoft Teams, Skype Meet, and others provide means for video conferencing. Social media platforms such as WhatsApp, Telegram, Facebook, Twitter, Instagram, and YouTube have also created opportunities for e-learning. As indicated by Biney (2020), the hybrid mode of learning is becoming the order of the day and is heavily powered by ICT as a teaching and learning tool. The selected institutions have also adopted the hybrid mode of learning using Sakai and VClass LMS platforms respectively, to formally supplement the conventional face-to-face teaching and learning process. These institutions have students with disabilities, including those with visual impairment, who also participate in the hybrid mode of learning. This study conceptualised students with visual impairment to include students with any form of limitation to their vision, either low vision or blindness.

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On a broader framework of accessibility, Agangiba and Agangiba (2019) investigated the accessibility of higher education institutions' websites in Ghana. The researchers used a designer to assess the accessibility of 15 Ghanaian higher education institutions' websites to see if they adhered to the World Wide Web Consortium's Web Content Accessibility Guidelines (WCAG 2.0). (W3C). According to the findings, most higher education institutions websites were inaccessible to students with visual impairment because they were neither perceivable nor operational. The study also discovered serious flaws in website usability. The majority of websites at Ghana's higher educational institutions were found to be inaccessible to students with visual impairment. The study exclusively focused on the websites of the institutions, overlooking the accessibility issues of the learning platforms of these institutions. Shaheen and Lohnes (2019) reported that issues of accessibility to instructional technologies, such as the LMS, are a concern in discourse on equal access to education. A significant number of students with disabilities can access learning resources and participate in online learning activities only by using assistive technology, which includes screen readers, text-to-speech software, voice recording applications, writing tools, and synthetic speech (Seale, 2013). Gill et al. (2017) conducted a study in New Delhi on empowering students with visual impairment through e-learning in higher education, focusing on the challenges students with visual impairment encounter when accessing e-learning materials. To collect data, a structured questionnaire comprising both close-ended and open-ended items was used, and participants were selected through a combination of convenient and random sampling. The study used simple statistical averages and Microsoft Excel to analyse the responses and draw conclusions. The study found that the majority of students lacked knowledge of how to use e-learning materials.

Coffie (2022) investigated the accessibility of e-learning tools to students with visual impairment at a university in Ghana. The study employed a quantitative and descriptive survey design. The census sampling technique was used to obtain data from 129 children with visual impairment. The data were evaluated using frequency counts, means, and standard deviations, as well as the independent samples t-test and Pearson product-moment correlation. It was also discovered that the level of accessibility of e-learning resources was inadequate and that students encountered difficulties in accessing e-learning materials provided through some of the e-learning tools. It was suggested that the university's management implement necessary measures to improve accessibility by reconfiguring systems and making changes to e-learning resources. The studies conducted by Gill et al. (2017) and Coffie (2022) employed the quantitative method to investigate participants' accessibility of e-learning tools and materials. These studies failed to consider the subjective experiences of the participants, which is crucial in gaining a comprehensive understanding of these accessibility issues.

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Biney (2020) completed a study that investigated adult learners' experiences with the Sakai LMS for learning in Ghana. The descriptive narrative method was used in this study to analyse the meanings and experiences of adult distance education learners when utilising the Sakai learning platform. In-depth interviews and focus group discussions were conducted to obtain data from the 50 adult learners. Although participants indicated that the Sakai platform increased access to self-learning, they also reported several challenges in using it, including difficulties in accessing computers and course materials online, weak links, poor connectivity, and power fluctuations. Due to the significant differences in the characteristics of the two groups of participants, it is not possible to generalise the findings of Biney's study to students with visual impairment. In another study conducted in Indonesia, Salmilah and Munawir (2024) evaluated the use of VClass LMS in the institutions and gathered data from both lecturers and students using questionnaires and interviews. Results showed that lecturers and students preferred to use other platforms such as Zoom and Google Classroom. It was suggested that the LMS managers should simplify navigation and address access speed constraints as well as ensure adequate server capacity. The study also stressed the need for training for students and lecturers to use the LMS.

On the contrary, a similar evaluation by Saputra and Rahmawati (2022) revealed that learning activities went on well between lecturers and students. It also reported that student learning outcomes while using V-Class showed excellent learning outcomes, and students were able to increase their learning independence. This was observed probably because the institution provided the requisite training to users for maximum benefit from the LMS use. The studies by Biney (2020), Salmilah and Munawir (2024), and Saputra and Rahmawati (2022) cannot be generalised to students with disabilities because of the differences in the needs of students with disabilities compared to adult learners and students without disabilities. In view of students with visual impairment, their difficulties using their vision to navigate the VClass or Sakai applications, which predominantly require visual observation to use, present challenges to these students. In contrast to adult learners and students without disabilities, students with visual impairment rely on their residual vision or other senses such as hearing to navigate such visually demanding applications. Moreover, persons with disabilities are relatively slower in executing tasks compared with their sighted counterparts. Therefore, if LMS platforms do not provide opportunities for customised speed settings, they may not effectively and fully access them.

This study aimed to investigate the learning experiences of students with visual impairment in using the LMS platforms in selected public universities. This study was conducted against the backdrop that students with visual impairment face greater disadvantages in the e-learning environment compared to those with other disabilities (Ravichandran et al., 2022), and practitioners or web developers rarely consider web accessibility guidelines for persons with disabilities (Schmutz et al., 2016). In this context, "access" refers to all the necessary resources

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and skills needed to use the e-learning platforms. Specifically, the following questions were posed to guide the study:

1. How do students with visual impairment access the LMS platforms?
2. How do students with visual impairment make use of the features and content of the LMS platforms?

2.0 METHODS

2.1 Researcher's positionality

I began my career as a resource person for students with special needs in the Department of Special Education at the University of Education, Winneba. For over seven years, I had been supporting students with special needs in their academic and social life on campus until I was employed as a lecturer in the same department. As part of my new responsibilities, I continue to support these students and provide training to prospective teachers for students with visual impairment. In the period of rapid transformation from traditional face-to-face learning to the use of online platforms during the COVID-19 pandemic, I observed some difficulties these students encountered. As a member of staff at the resource centre, I had to discover other ways to make them participate in the teaching and learning processes. The resource centre's staff had to devise alternative methods for obtaining and ensuring the accessibility of learning materials, as well as facilitating their participation in assessment processes. Colleagues at the University of Ghana also reported similar concerns about their students with visual impairment. Most of the students were still going through these accessibility experiences even after the lockdown and when they reported to school because the universities had adopted the hybrid mode of learning to promote social distancing and reduce the spread of the virus. It was these observed experiences that motivated me to conduct this study.

2.2 Research Design

This study adopted the phenomenological research design, which is anchored in the qualitative approach. Phenomenology seeks to identify and describe subjective experiences of respondents regarding a phenomenon (Yin, 2016). This study sought to understand the subjective experiences or personal narratives of students with visual impairment and the use of LMS in their academic interactions. It explores the perspective of participants on how they experience the LMS platforms and the challenges they encounter in using these platforms.

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2.3 Population and Sample

The population of the study was all 38 and 86 students with visual impairment University of Ghana (UG) and University of Education, Winneba (UEW) respectively. These students were between the ages of 21 and 45 years, with an average age of 26 years. They were regular undergraduate students. A total of 11 participants were conveniently sampled for the study. This was because all the students with visual impairment had registered with the disability support offices of the institutions and had participated in learning interactions using the LMS platforms. In this regard, any of them who were willing to participate in the study could give credible data regarding their experiences using the learning platforms. Table 1 presented the demographics of participants.

Table 1: *Demographics of Participants*

Institution	Visual Status		Age Range
	Low Vision	Blind	
U-A	2	3	21 - 34
U-B	2	4	20 - 36
Total	4	7	21 - 36

2.4 Study Instrument

A semi-structured interview guide was used to elicit data on the experiences of participants in accessing the content and using the features of the LMS platforms. The instrument was made up of some predetermined questions and open-ended questions that allowed participants to share their personal experiences during the interview. The open-ended nature of some of the items on the guide allowed for follow-up and probing questions to gain in-depth insight into their perspectives. The guide was developed based on the themes in the study objectives. The guide was pretested on three students with visual impairment to detect ambiguities and weaknesses in the items for correction and modification so as to improve the trustworthiness of the instrument. The researcher conducted one-on-one interviews via telephone and face-to-face for the convenience of participants. According to Creswell (2012), during a one-on-one interview, the researcher asks questions to and records answers from only one participant in the study at a time.

2.5 Procedure for Data Collection

Prior to the data collection process, I applied for and received ethical approval for the research from the Institutional Review Board, University of Cape Coast with approval number UCCIRB/CES/2023/31. I began the data collection process by seeking informed consent from participants. Participants who participated in the telephone interviews gave verbal consent, which was recorded, while those who participated in the one-on-one face-to-face interviews signed or

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thumb-printed an informed consent form. This was after I contacted the participants to explain the study and its risks and benefits and assured them of the anonymity and confidentiality of the data. Subsequently, I scheduled interview appointments with the participants. I interviewed five participants from U-A and six from U-B. After interviewing these numbers of participants, the researcher realised that a point of saturation had been reached in the data gathering in each institution since participants were re-echoing what others had said.

It took the researcher 5 days to gather data from the participants. Each interview session lasted between 11 and 25 minutes. Participants were given the opportunity to express their feelings and experiences without undue pressure on them. The interviews were tape-recorded with the permission of participants and transcribed for analysis. The transcript and recorded responses were sent to the participants via WhatsApp for confirmation and approval.

2.6 Data Analysis

The inductive thematic analysis was employed. According to Braun et al. (2019), thematic analysis is the most widely used qualitative analysis method in psychology. In this study, the researcher analysed the transcribed responses from the respondents by inductively coding them for categorisation. The coding and categorisation helped the researcher identify the themes that emerged. Verbatim expressions of the students were used in reporting the data where necessary. The students from each institution were given numbers to anonymise their identity, and the institutions were also coded with U-A and U-B.

3.0 RESULTS

3.1 Research Question 1: How do students with visual impairment access the LMS platforms?

In analysing this research question, three themes were derived from participants responses. The themes were lack of preferred digital tools, connectivity challenges, and training concerns.

Lack of Preferred Digital Tools

This theme highlighted participants preference to use personal computers for online learning, but most depend on personal mobile phones, which some feel restricts their effective usage of the learning platforms. The following comment from the participants emphasises their sentiments:

> *For some of us who do not have personal computers, it is our mobile phones we use to access the Sakai because we are not always on campus to use the computers provided by the office of students with disabilities* (Student 2, U-A).

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> *I can say that most of my colleague students with visual impairment do not have personal computers, so we use our mobile phones to access the VClass which I must say is quite difficult for some of us. Sometimes too we use the computers at our resource centre, but they are not adequate considering our number, so we don't have access to it all the time* (Student 1, U-B).

> *I was using my mobile phone for the online learning activities, but now the phone I have does not support it since I lost my android phone. I also don't have a personal computer, so you can imagine how difficult it will be for me to access the VClass. A number of my colleagues also don't have phones that support it* (Student 6, U-B).

It is evident from participants' comments that if participants had options, they would use personal computers for online learning rather than using mobile phones. Also, limitations in accessing computers and supportive mobile phones affected their accessibility to the LMS platforms.

Internet Connectivity Challenges

On the issue of internet connectivity, experiences of participants were similar across the two institutions. They reported how weak and unreliable internet connectivity affected how they access the LMS platforms. This is what participants had to say in this regard:

> *You see, Sir, not all of us live on campus, and the wifi available to students does not reach our hostels, so we always have to use our data for online learning activities, which is a financial burden for some of us. This greatly affects how we access and use the Sakai* (Student 1, U-A).

> *Our major challenge in accessing the Sakai is bad internet connectivity on campus. Although I stay in a hostel on campus, I am often unable to connect to the university wifi. Whenever it connects to it too, it is always weak and does not support any online activity* (Student 4, U-A).

> *Internet connectivity is always a problem for us in using the VClass. Sometimes, we are unable to connect to the wifi even when we are on campus. Other times you will be connected, but you cannot even open any app or site. How can you use this to perform activities on VClass. It can be frustrating!* (Student 3, U-B).

> *One of the difficulties we face in accessing the VClass apart from the lack of computers, is the bad internet connectivity* (Student 5, U-B).

The participants expressed that poor internet connectivity and the high cost of mobile data serve as major barriers to accessing LMS platforms like Sakai and VClass. The majority of the students report that the university's Wi-Fi is either unavailable in their hostels or too weak to support any

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meaningful online activities, even when they are on campus. As a result, they are often forced to rely on personal mobile data, which creates a significant financial burden. This unreliable and limited internet access greatly affects their ability to effectively access and participate in online learning.

Training Concerns

The theme that revealed divergent responses from the participants in the two institutions was training needs in using the LMS platforms. This is what they indicated:

> *Here, all students with visual impairment that report to school for the first time are given some days of training in using Sakai because it has now become part of the mode of teaching and learning in the university. So, most of us have knowledge and some level of skills in using it* (Student 3, U-A).
>
> *I think the initial training we receive as new students by personnel at the office of students with disabilities has helped us in navigating the interface of the Sakai platform. In fact, this has contributed about 70 percent to our ability to use the platform* (Student 4, U-A).
>
> *Whenever we report to school for the first time, the resource centre for students with special needs tries to train us on how to use the computer, which is not always effective because we lack adequate computers at the centre. They don't really train us on the use of the VClass which we also need. We learn the use from friends and sometimes individually from our ICT instructors* (Student 6, U-B).
>
> *I don't know why the resource centre does not teach us how to use the LMS platform. This does not encourage us to use it because we don't have the skills to use it. So, we take online slides from a few of our colleagues who are good in ICT and are able to download the files* (Student 4, U-B).

It is clear from the participants' responses that they receive initial training on the use of Sakai platform at the university; however, some reported gaps in this support, particularly regarding the VClass platform. Limited resources and inadequate computers reduce the effectiveness of training sessions, leading some students to rely on peers for downloaded files and other support.

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3.2 Research Question 2: How do students with visual impairment make use of the features and content of the LMS platforms?

The analysis of participants' responses to interview items relating to this research question reveals two themes: navigation difficulties and document accessibility gaps.

Navigation Difficulties

In terms of the navigation of LMS platforms, students with visual impairment reported both successes and challenges in accessing certain features of the platform. This is corroborated by the responses provided below:

> *I will say that those of us who have low vision don't have many problems with the use of the Sakai LMS. Any student with low vision who knows how to use ICT devices like the computer and mobile phones can make effective use of the content and materials on the platform. Except that we have one major challenge that related to both access and use; it has to do with the unavailability of the enlargement feature on Sakai. Because of this, we have to install additional software like Fusion. Doing this can be somehow difficult, especially on our mobile phones, for a person who is not very good at using the phone* (Student 2, U-A).

> *I have low vision, and I will also say that I am better than most students with visual impairment in the use of ICT, so I am able to navigate and use the VClass well. When it comes to doing quizzes with it, that is when I have some challenge with time allotted, which is the same as that of a sighted person who reads with his eyes. You know, the navigation process is quite slow for us with visual impairment* (Student 5, U-B).

Two other students had this to say:

> *In fact, for me, I want to say that there are limited accessibility features of Sakai on our phones, which sometimes make its use difficult. Most of us use our phones for this, and so we find it difficult with the talkback to use the downloading tool to download slides. So, we mostly have to seek the help of a sighted colleague or make them download and share with us* (Student 3, U-A).

> *I think the VClass is good because most of our sighted colleagues are able to use it. For us, only a few who have personal computers or phones that support it and are good at using the computer with the screen readers use it. The majority of us do not use it, not to mention participating in our quizzes with it, because the interface is not easily accessible by those of us with below average levels of ICT knowledge. You need to be very good in ICT to be able to navigate and use that interface* (Student 1, U-B).

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The participants' responses show some level of skill in using the computer is generally needed to use the LMS platforms. However, except for some participants who had low vision, most of these students appear not to have the requisite skills in ICT devices for successful use of the LMS platforms effectively.

Document Accessibility Gaps

Students with visual impairment expressed their satisfaction with the accessibility of most documents shared on the LMS platforms. However, they indicate some gaps in accessing some kinds of files provided on the platforms. They revealed that they had difficulties with picture files, charts, tables, and certain PDF files. Some participants affirmed these concerns in the comments below:

> *As for the materials given on the Sakai LMS, we don't have many difficulties with it. Now our screen readers and talkback on our phones are able to read PowerPoint slides, Word document and PDF files. Only that sometimes the materials given have some pictures, which are difficult to read* (Student 4, U-A).
>
> *I think that when lecturers provide pictures and charts, they should always give a vivid description of them for those of us with visual impairment. If they are in such formats without a description of them, we are unable to access them. I think that for those of us who have access to computers and can use them to some extent, we are okay with most of the files provided on VClass* (Student 2, U-A).
>
> *I must say that the majority of the documents on the VClass platform are accessible to me, like the PDF documents, PowerPoint slides and Word files. But I have to say that there were some PDF files I downloaded that I could not read because they were like picture PDF. I also find it challenging to make meaning from some tables in the documents they provide* (Student 5, U-A).
>
> *One other issue we have to mention is the quiz interface on VClass. Some of us found it difficult to access it. Even our colleagues we know are good at using the computer don't find it easy to access the interface. Also, the quizzes organised on VClass are not set up differently for us, so we had to use the same time as our sighted counterparts, and this was not good for us* (Student 7, U-B).

It could be noted from the comments of the participants that accessing and making meaning of some learning materials provided on the LMS platforms was difficult for them due to their format. Moreover, participants appear to have issues with the time allotted and the interface for conducting quizzes on the VClass.

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4.0 DISCUSSION

The findings of the study showed that participants primarily used mobile phones for accessing LMS platforms due to lack of personal computers and convenience. However, issues like unstable internet and unavailable Wi-Fi connectivity in their hostels negatively impact their access. According to the participants, internet connectivity is considered a basic need for LMS platforms. Another issue that emerged from the responses of the participants was their training in using LMS platforms. While students in one of the universities were pleased with training sessions organised for them and appreciated how that contributed to their access and utilisation of the LMS platform, participants from the other institution looked forward to such training sessions. The findings are consistent with those of Biney (2020), who reported challenges using Sakai, including difficulties in accessing computers, weak links, poor internet connectivity, and power fluctuations. Similarly, Sarker et al. (2019) reported in their study that poor internet connection restricted access to e-learning platforms. The current study confirmed the findings of Asio et al. (2021), who reported that smartphones topped the list of devices used by students for online learning. They Asio et al. (2021), reported that 70% of their participants had access to internet connectivity at home for online learning, which is contrary to the current findings. Although, these studies did not involve students with visual impairment, it appears the use of online learning platforms is generally shrouded with these setbacks.

Additionally, participants' comments regarding how they make use of the features and content of the LMS platforms showed that the virtual learning environments are deficient in certain accessibility features, such as in-built screen reading and magnification features. This resulted in students using third-party applications like Fusion to access the features and content. The analysis also revealed that the mobile phones which are mostly used by students for virtual learning, present some difficulty in using some features or tools of the LMS platforms. It was also clear that the participants' experiences differed across the two institutions. Students in University 1 have better experiences with the use of Sakai compared to participants in University 2 who use VClass. The differences appear not to be much about accessibility issues with the two platforms, except for the difficulty in using the quiz interface and quiz duration on the VClass. The differences reported appear to be more of personal and institutional inadequacies, such as inadequate computers, lack of training, and lack of personal computers or supportive mobile phones. The findings are consistent with those of Amponsah and Bekele (2022), who reported that there is a digital divide between students who come from well-to-do and poor socioeconomic backgrounds, indicating that not all students with visual impairment have access to technology (computers and mobile phones) for online learning. They further reported that some learning management systems do not have special features or capabilities that serve the needs of students with visual impairment. Again, the study supported Carlsen et al. (2016), who reported that inadequacy of computers and their

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accessories as well as lack of retooling and refurbishment of the computer laboratories are challenges confronting e-learning in the global south. It is also worth noting that the findings of the study by Maboe et al. (2018), which indicated that not all usability principles for students with disabilities are satisfied by the study institution's e-learning websites, seem to be supported partly in the current study.

4.1 Implications for Practice in Education of the Visually Impaired

Universities must prioritise developing mobile phone-friendly LMS platforms to enhance access and promote the participation of students with visual impairment in online learning, enabling them to access learning materials and participate in online activities using their mobile phones. Furthermore, the learning platforms must be equipped with accessibility features, such as screen readers, voice assistants, and screen enlargement tools to support students with visual impairments' participation and learning needs. In addition, the universities must also offer regular training and technical support to students to promote the use of LMS platforms and address any concerns that may arise during their usage. Finally, the institutions should provide strong internet connectivity and adequate computers to students for use in online learning.

4.2 Limitations

The findings regarding the use of online platform features and content may not be solely attributed to LMS platform design, as participants exhibited varying levels of ICT skills that could influence their accessibility to the platforms. Methodologically, the study could have gathered additional observational data to triangulate the findings; however, such an effort was not feasible due to certain constraints. However, I believe that the in-depth data gathered through the interviews have mitigated against the impact of these limitations on the credibility of the findings.

4.3 Conclusion

The study concluded that institutional support systems, training initiatives, and platform design substantially affect the access and involvement of students with visual impairment in online learning. Addressing these barriers through inclusive design principles, enhanced infrastructural support, and personalised training opportunities is essential for ensuring equitable access to online learning environments. Applying Universal Design for Learning (UDL) principles to LMS platform development and offering accessible content formats would significantly enhance the educational experiences of students with visual impairment.

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DECLARATION

Data Availability: Access to the anonymized dataset can be made available upon reasonable request to the author, subject to institutional data-sharing policies and appropriate ethical approval.

Declaration of Conflicts of Interest: The author declares that there is no conflict of interest associated with this study.

Ethics Approval and Consent to Participate: Ethical clearance for the study was obtained from relevant academic gatekeepers. Informed consent was sought and obtained from all participants before the interviews.

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