GENDER, PREFERRED DIGITAL PLATFORMS AND REMOTE TEACHING/LEARNING ACTIVITIES AMONG UNDERGRADUATES WITH HEARING IMPAIRMENT IN ALVAN IKOKU FEDERAL COLLEGE OF EDUCATION, OWERRI, IMO STATE

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ABSTRACT
A descriptive survey research approach was chosen for the investigation. The method of
inquiry was chosen since the researcher employed a questionnaire to collect information
from respondents. The population includes 41 undergraduates with hearing impairment
at Alvan Ikoku Federal College of Education, Owerri, Imo State and 7 lecturers. The
study sample consists of thirty-four (34) out of 41 students with hearing impairment who
were registered for regular /evening programmes and, seven (7) lecturers who taught them
remotely. The data gathering tool was a structured questionnaire adapted from Okoro
The instrument was validated for face and content validity. The questionnaire was
administered through the help of three research assistants. Pearson Product Moment
Correlation Statistics (PPMC) was used to test hypotheses at the 0.05 level of
significance. The findings revealed a substantial association between preferred digital
platforms and perceived effectiveness of remote teaching/learning. However, no positive
relationship was observed between gender and preferred digital platforms among students
with hearing-impairment at Alvan Ikoku Federal College of Education, Owerri. In
accordance with the findings, it was recommended, among other things, that students be
consulted concerning their preferred digital learning formats and instructors be given
incentives and timetables for developing, preparing, and uploading instructional contents.

KEYWORDS: Digital Platform, Remote Teaching, College of Education, and Hearing
Impairment
INTRODUCTION
Remote learning activities are becoming prominent in the educational sector. According to Ali (2020), many computer and internet-related facilities are employed in academic settings, and the efficiency of their utilization is largely based on the teachers' ability to comprehend and operate such equipment and software. Digital platforms used in school settings make use of Apps with video, text, speech, graphs, sign language interpretation, tactile typefaces, and other features. Just like students with normal hearing, students with hearing-impairment have been having issues using digital platforms for learning for many years, resulting to issues like low academic achievement, a low level of involvement in class activities, and a sense of discrimination or exclusion. Although the use of a digital platform has been and continues to act as a trustworthy medium for teaching pupils who are hard of hearing or hearing-impaired, this platform has served as an avenue to bridge gaps of distance and communication (Anyanwu, Atteng, Ibeabuchi & Orji 2023).

The instructional use of digital platforms for remote teaching/learning in special schools is a key step toward personalizing learning routes and using active teaching approaches. It has been established that digital platforms are chief instruments for giving diverse stimuli via multimedia, providing modular and flexible materials, and enabling novel teaching methodologies. This implies that hearing-impaired pupils will have access to educational modalities other than physical face to face teaching. Researchers such as Hauser, et al., (2010) and Ibáez & Delgado-Kloos, (2018) believe that the advancement of digital technologies will provide opportunities for hearing-impaired people to access public administration services, e-commerce, and interpersonal relationships, particularly through text chat and video chat.

Remote teaching entails the use of virtual learning platforms and settings such as Google Classroom, Zoom meeting, Telegram, Whatsapp, and others that are online internet gateways for online learning. Through directives from the Federal Ministry of Education in Nigeria encouraging all levels of education from primary to tertiary to begin online teaching of students through the use of various virtual learning platforms, remote teaching/learning became necessary, particularly in tertiary institutions. The Federal Government of Nigeria has worked hard to incorporate information and communication technology into the educational system. This has been accomplished through policy, curricular development, and modifications (Power & Power 2009; Anyanwu, Atteng, Ibeabuchi, & Orji 2023). All stages of education require an introduction to computer use. There is a need to use platforms that support a drop in studying shortcomings attributed to visually and hearing impairments, plus the proper inclusion and involvement of this e-learning App usage to improve learning experiences, especially in this era of advocacy for inclusive societies and inclusive learning environments (UNESCO, 2021).

Virtual coaching and study seem to differ substantially from traditional educational practices in classrooms and lecture halls for hearing-impaired students (Burgstahler, 2015). Hearing-impaired students are today expected to learn and work in settings dominated by technological advances and a plethora of languages and communication types (Eagleman, 2015). However, research indicates that most digital learning environments are frequently designed for and by hearing people with little accommodation for those with impaired hearing; this creates constraints and affordances for learners with impaired hearing, educators, and schools (Anyanwu, Atteng, Ibeabuchi & Orji, 2023).

The investigator learned as an instructor that online media provide for private remarks to individual students, as well as anonymity, whole group instructions, small group instructions, questions and assignments, video, slides, voice notes, and graphics.
These measures contribute to making instructions more accessible to all learners, especially those with hearing and vision challenges.

Though non-hearing-impaired and hearing-impaired individuals use equivalent technology, learners with impaired hearing engage with digital education in ways that show up quite distinct from their hearing peers. These critical differences in the user interface and instructional layout have significant repercussions for instructional strategies in both commonplace and focused schooling contexts where these students learn. Also other researchers (Shepherd & Alpert, 2015) have found that students with impaired hearing, encounter electronic learning in manners that are significantly different from their hearing peers. One of the most common methods of educating hearing-impaired learners is to include digital learning tools into the teaching/learning process. These technologies would let instructors of students with hearing impairment create visual-based instructional materials for their students. This implies a growing use of internet-based resources in higher education institutions with deaf students. It is therefore vital to explore the influence of online resources on remote teaching/learning among students who are deaf or hard of hearing. The preferred digital platforms and perceived influence on remote teaching/learning activities among hearing-impaired students at Alvan Ikoku Federal College of Education, Owerri, Imo State, was investigated in this study.

**Statement of the Problem**

Online environments are a key facilitator of remote teaching/learning. Despite the importance of digital platforms for teaching students who have impaired hearing, Anyanwu et al (2023) identified potential challenges such as technical barriers of failed or no network that may affect access and use of this medium for learning, low self-efficacy, difficulties in using different platforms, and so on. Learners may have little confidence in their ability to handle software for learning in remote teaching/learning. Some students may have struggled employing various online mediums or their favorite platform. Signed language may be scarce, which may have an enormous effect on course accessibility and the overall learning experience, ultimately becoming an impediment for hearing-impaired students Mohammed (2021). It is crucial to remember that hearing-impaired individuals are visual learners who, due to their impaired hearing, may only focus to one visual input at a time.

Students who are deaf/hard of hearing may face challenges and limits with regard to content accessibility. The internet speed at their end and the internet speed at the interpreter's end could represent the most significant hurdles to comprehension. The students' sign language to the interpreter may be slow, disjointed, and frequently misinterpreted when their web connection is poor. Participants may express dissatisfaction with the quality of the recording device and internet connection offered to one of the translators. Similarly, if excellent footage is not used or is not available, the information may be distorted. This can confound students and make it difficult for them to retain all their educator intended them to grasp. Aside from a lack of student preparation, little thought was given to how the interpreter would fit into the functioning of the class, notably at Alvan Ikoku Federal College of Education, Owerri, Imo State. Nwachukwu & Anyanwu,(2021) stressed the need for teachers to use multimedia channels of communication when teaching the deaf. This is due to communication issues among students are hard of hearing, or totally deaf (Zrigat & Al-smadi, 2012).

There is an appetite for e-learning applications that will substitute for their losses of communication opportunities. People who are restricted from using apps for online education are less likely to participate actively in learning activities. This has culminated
in low academic success, or what some writers have characterized as 'dumping', as well as a lack of participation and a sense of prejudice or exclusion. One of the most important issues affecting hearing-impaired student instructors in schools/universities today is the lack of modern, customized instructional software that allows them to remotely develop and transmit learning content for hearing-impaired pupils. However, there is currently a flaw in the developed platforms, specifically lack of particular features that allow hearing-impaired student instructors to readily prepare and administrate educational materials for their students. Consequently, this study focused on how digital platforms have influenced remote teaching/learning among hearing-impaired students at Alvan Ikoku Federal College of Education, Owerri, Imo State. The study investigated the preferred digital platforms and perceived impact of remote teaching/learning among hearing-impaired students at Alvan Ikoku Federal College of Education, Owerri, Imo State.

**Digital Platforms and Remote Teaching/learning**

It is hardly surprising that technology has played an important part in the education of the hearing-impaired throughout history. Baroni and Lazari,(2020) acknowledged that remote teaching is beneficial to learners with hearing impairment and appreciated by their families when it was utilized during the Covid-19 lockdown era. To varying degrees, all of these advancements have an impact on educational design and delivery of instruction throughout higher education, but they are especially relevant for hearing-impaired individuals in the setting of digital learning. People who are deaf or hard of hearing have long been at the cutting edge of technological innovation and communication research (Bauman & Murray, 2014). Thomas Edison, the creator of the modern-day light bulb, was hard of hearing. Alexander Graham Bell invented the telephone because both his mom and wife were deaf. One of the internet's early pioneers, Vincent Cerf, had impaired hearing which made him to use hearing aids. Similarly, a team of hearing-impaired researchers led by Paul Taylor produced the T**eletypewriter which was a predecessor of the telephone-text message revolution and the first true broadband (Maiorana-Basas & Pagliaro, 2014).

Larger systems and networks embedded inside digital platforms regulate the motives and features of hearing-impaired schooling (Garcia, 2009). Digital hearing-impaired education is deeply ingrained in ideological, linguistic, cultural, educational, and historical contexts, all of which impact the design as a whole strategy for digital-learning platforms in the university system (Raike, 2006; Thoutenhoofd, 2010). Because digital content is usually multimodal, it includes visual information that hearing-impaired learners can access as well as unreachable aural content in a variety of other choices, many of which are either not known in the research literature or are only hazily defined. As a consequence, the proportion of hearing-impaired students in educational institutions, especially during higher education, would rise. While research on the use of Information and Communication Technologies for hearing-impaired students is rare, previous research has shown that using some digital educational resources, such as virtual environments, Assistive Remote technologies, digital games, e-learning portals, and mobile learning software, help hearing-impaired students learn. The presentation of a range of subject matters with sign language translations is the emphasis of remote teaching/learning with hearing-impaired pupils. Likewise, it would tackle some shortcomings of traditional hearing-impaired students' learning in schools/universities. Such hindrances as inadequate comprehension and reading of learning content texts, a lack of professional sign language translators in classrooms. Equally shortcomings like a lack of out-of-class learning material plus learning material reiteration and an absence of multi-visual methods of learning for presenting learning content are taken care of.
In their study, Thakur, et al. (2019) found no significant relationship between digital media and remote teaching/learning since this platform has less rapid processing rates for hearing-impaired students than for hearing students. Instructors would not know when to come to an end, wait for students to read the slides, and then watch as their eyes returned to the translator if they were not trained. It was difficult to observe this throughout the online distance study.

Prior research has demonstrated the need of deploying e-learning systems for deaf students. According to Shepherd and Alpert (2015), incorporating a distance teaching and speech-to-visual technique e-learning system had major advantages when educating hearing-impaired students because it facilitated the retention of knowledge and addressed their specific needs. Furthermore, Thakur, et al. (2019) observed that employing a digital platform and remote teaching improved the academic performance of hearing-impaired and hearing-impaired -blind students by 46.25% and 87.5%, respectively. Furthermore, Maiorana-Basas and Pagliaro (2014) discovered that hearing-impaired students had a good attitude toward the Digital Learning Platform, however their perceptions differed on the platform's ease of use and complexity.

Several studies on websites and distance learning for hearing-impaired students have been undertaken. Luft (2009), for example, performed blended learning research for deaf and hard-of-hearing students and found that including remote teaching/learning aspects strengthened their interactions with their teachers and other students via a digital platform.

Kim and Chen (2016) discovered that, while there have been many successes in teaching hearing-impaired students online, there are also challenges such as system glitches, a shortage of captions, teachers who are not used to dealing with hearing-impaired students in online classrooms, and many more, but they came to the conclusion that the digital platform is still the best way for this type of student to learn and be taught. Furthermore, Beal-Alvarez and Cannon (2014) proposed that remote teaching/learning be used to improve learning materials in the classroom because subtitles have a significant effect on the subject matter comprehension of hearing-impaired students taking online courses.

Burgstahler (2015) observed that digital platforms were connected with online teaching/learning among impaired students in a study on the relationship between digital media and online learning strategies most suitable for students with impairments. In his study, Ali (2020) observed three categories of obstacles experienced by hearing-impaired students while accessing online learning: course content and material difficulties, learning management system (LMS) obstacles, and course content and material difficulties. He also observed that remote teaching is the most effective method of instruction for deaf students who use electronic devices. Valentine and Skelton (2009) observed in their study that online technology and remote teaching enhanced learning outcomes and made communication simpler. They recommended the adoption of best practices to increase the use of remote teaching/learning.

**Sex and Digital Platform**

Sex has a role in hearing-impaired people's use of e-Learning platforms. There is evidence that women have more negative attitudes toward e-learning platforms than men, and using digital platforms for remote teaching/learning may be more difficult and stressful for women than for men (WHO, 2020). In accordance with some studies, men prefer distance instruction and learning over women. Male hearing-impaired students were more inclined than female hearing-impaired students to use a digital platform for learning, according to Hauser, et al. (2010). Mohammed (2021) demonstrated that
hearing-impaired students participating in online education faced challenges related to institutional support, social inequities, and an insufficient sociolinguistic foundation. Lucker (2012) showed that language barriers were perceived as a hindrance, particularly for female students, because online learning for learners with impaired hearing required the usage of English and American Sign Language (ASL). According to Luft, et al. (2009), online learning for male hearing-impaired students provides specific benefits that are obtained through academic achievement, and the level of involvement in online learning platforms has a substantial influence on the students' performance. In the same vein, a study done by the National Hearing-impaired Center (2020) revealed that, while female hearing-impaired students had difficulties in online learning, the help they received from numerous stakeholders benefited them in overcoming these difficulties.

The study examined the preferred digital platforms and perceived influence of remote teaching/learning activities among hearing-impaired students in Alvan Ikoku Federal College of Education, Owerri, Imo State. Precisely, the objectives are, to:

- look into the connection between a digital platform and remote teaching/learning among students with hearing-impairment at Alvan Ikoku Federal College of Education, Owerri, Imo State and,
- to explore the association between hearing-impaired students' sexual orientation and preference for digital platforms at Alvan Ikoku Federal College of Education, Owerri, Imo State.

The following hypotheses guided the study:

1. There is no statistically significant link between preferred digital platforms and perceived effectiveness of remote teaching/learning among hearing-impaired students at Alvan Ikoku Federal College of Education, Owerri, Imo State.
2. In Alvan Ikoku Federal College of Education, Owerri, Imo State, there is no significant link between gender of students with hearing-impairment and preferred digital platforms.

METHODOLOGY

The study employed a descriptive survey research design. The researcher used questionnaire to acquire information from respondents. The study's sample includes forty-one (41) participants chosen from the population using a purposive random sampling technique. Thirty-four (34) students with hearing-impairment were chosen out of 36 students who were registered for regular and evening programs and who met the benchmark with requisites for specific support to continue their studies. Also seven (7) lecturers who teach hearing-impaired students remotely were selected for the study. Two questions of enquiry were given to guide the inquiry. Okoro (2015) designed a structured questionnaire, which the researcher termed Digital Platforms for Remote Teaching among Hearing-impaired Students (DPRTDS). The instrument's face and content validity were assessed by three experts. To examine the instrument's reliability, twenty (20) hearing-impaired students from outside the research cohort were given the instrument. Cronbach Alpha statistics was used to assess the collected data, yielding a reliability coefficient value of 0.90. The score is high enough to guarantee that the instrument will be utilized in the field. After receiving permission from the institution and with the aid of three research assistants, respondents completed the questionnaire, which was then retrieved from them. Hypotheses were tested at the 0.05 level of significance. Pearson Product Moment Correlation Statistics (PPMC) was used to examine hypotheses 1 and 2.
RESULT

Hypothesis 1: There is no statistically significant link between preferred digital platforms and perceived effectiveness of remote teaching/learning among hearing-impaired students at Alvan Ikoku Federal College of Education, Owerri, Imo State.

Table 1:
Relationship between Digital Platform and Remote teaching

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>R</th>
<th>p-value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Platform</td>
<td>41</td>
<td>.46</td>
<td>0.002</td>
<td>significant</td>
</tr>
<tr>
<td>Remote Teaching</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

α= 0.05

The association between preferred digital platforms and perceived effectiveness of remote teaching/learning among hearing-impaired students at Alvan Ikoku Federal College of Education is shown in Table 1. The correlation coefficient (r) is obtained from the table .46, indicating that there is a beneficial association between preferred digital platforms and remote teaching/learning among hearing-impaired students. At 0.05., the correlation coefficient is significant. Consequently, the null hypothesis, there is no significant association between preferred digital platforms and remote teaching/learning among hearing-impaired students at Alvan Ikoku Federal College of Education is rejected.

Table 2:
Relationship between Sex and Digital Platform

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>R</th>
<th>p-value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>41</td>
<td>.66</td>
<td>.23</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Digital Platform</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

α= 0.05

Table 2 depicts the association between sex and digital platforms among Alvan Ikoku Federal College of Education hearing-impaired students. The correlation coefficient (r) of .658 in the table indicates a negative link between sex and digital platform among hearing-impaired students. Because the p-value of .23 is bigger than the alpha level of 0.05, the correlation coefficient is not significant when tested at the 0.05 alpha level. Consequently, the null hypothesis 'there is no significant link between sex and preferred digital platform among hearing-impaired students at Alvan Ikoku Federal College of Education' is sustained.

DISCUSSION OF FINDINGS

According to the findings of Hypothesis 1, there is a considerable association between preferred digital platforms and perceived effectiveness of remote teaching/learning. According to the findings of the study, there is a significant favourable association between preferred digital platforms and perceived gain from remote teaching/learning among hearing-impaired students at Alvan Ikoku Federal College of Education. This study supports the findings of Thakur et al (2019), Martins, (2015), and Burgstahler (2015), who discovered a favorable link between digital platforms and remote teaching/learning.
The findings of Hypothesis 2 revealed that there were no statistically significant association between sex and preferred digital platforms. According to the findings of the study, there are substantial negative associations between sex and the preferred digital platforms for remote teaching and learning among students with hearing impairment at Alvan Ikoku Federal College of Education. This study contradicts the findings of Mohammed (2021), Lucker (2012), and Luft (2009), which discovered a positive link between sex and digital platform.

**CONCLUSION**

Consequently, the researcher found that students preferred digital platforms have a significant association with their perceived effectiveness of remote teaching/learning, but sex has a negative relationship with preference to digital platforms. This means that among students with hearing impairment at Alvan Ikoku Federal College of Education, there was a link between preferred digital platform and effectiveness of remote teaching/learning but no association between sex and preference for digital platforms used in teaching and learning.

Based on findings of this study, the following recommendations are made:

1. Teacher training colleges should provide institution-based inclusive digital learning platforms for students with hearing impairment. These platforms should include elements that enable for the presentation of teaching in text, audio, video, pictorial, and other media.
2. Students should be consulted to determine their preferred digital platforms for remote learning effectiveness.
3. Teachers should be given deadlines for developing, preparing, and uploading educational materials to a digital platform.
4. Recognition and compensation should be provided to inspire academics to utilize students preferred the digital platforms.
5. Lecturers should be given re-tooling training to improve on their use of digital learning tools. Lastly,
6. Institutions should identify and implement strategies to make digital platforms for remote teaching/learning more accessible and less expensive to students with hearing impairment.

**REFERENCES**


