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Educators' Point of View on Supporting Students with Hearing and Visual Challenges in Online Education

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EDUCATORS' POINT OF VIEW ON SUPPORTING STUDENTS WITH HEARING AND VISUAL CHALLENGES IN ONLINE EDUCATION

Abstract: Lecturers' perspectives are vital for fostering inclusive online environments, as they provide essential support and accommodations for students with hearing and visual impairments. Thus, this study aims to identify and analyse the challenges faced by UiTM students with hearing and visual impairments during online learning, highlighting the unique barriers they encounter in this educational setting from educators' point of view. Employing a quantitative research approach, the study examines the diverse challenges perceived by lecturers of students with sensory impairments. Thirty participants completed a survey questionnaire comprising three sections with six variables each, tailored to investigate the difficulties experienced by students with sensory impairments. Findings indicate that many lecturers lack advanced notice from the faculty about teaching visually and hearing-impaired students, affecting their readiness. While some require 1-2 weeks to convert course materials into alternate formats, others lack systematic guidelines for teaching graphics. Although 66.7% of lecturers teaching visually impaired students and 20.0% teaching hearing-impaired students have converted materials to electronic readable formats, a significant proportion reported no provision of assistive technology by the faculty. Extra time is granted during examinations, with varying durations. The study highlights the need to tailor accommodations to students' diverse needs and calls for more research on effective support strategies.

Keywords: Visual impairment, hearing impairment, online learning, barriers

Introduction

In higher education settings, students with hearing and visual impairments face a myriad of challenges that can significantly impact their academic experience. These challenges, ranging from communication barriers to accessibility issues, require a nuanced understanding to support these students in their academic journey effectively. One key perspective that can shed light on these challenges is that of their lecturers, who play a pivotal role in facilitating learning and providing accommodations for students with disabilities. According to a study by Los (Santos *et al*., 2019), lecturers are crucial stakeholders in creating inclusive environments for students with disabilities, including those with hearing and visual impairments. Understanding the perceptions of lecturers is essential as they are often the frontline support for students with disabilities, providing accommodations, guidance, and academic assistance (Amin *et al*., 2021). By exploring their perspectives on the challenges these students face, this research seeks to uncover valuable insights that can drive positive changes in how higher education institutions support and accommodate students with hearing and visual impairments.

Through this study, we aim to contribute to the existing body of knowledge on disability inclusion in higher education and provide practical recommendations for enhancing the academic experiences of students with hearing and visual impairments. By amplifying the voices of lecturers and highlighting the challenges they observe in their daily interactions with these students, we hope to pave the way for a more inclusive and equitable educational environment for all. As online learning becomes increasingly prevalent in today's educational landscape, it is essential to address the challenges faced by students with hearing and visual impairments. In the context of UiTM, understanding the specific obstacles encountered by these students is crucial for ensuring inclusive and accessible education. This study aims to identify and analyse the problems and difficulties experienced by UiTM students with hearing and visual impairments during online learning, shedding light on the unique barriers they face in this new educational environment. Through this exploration, valuable insights will be gained to inform the development of supportive measures and accommodations that can enhance the online learning experience for these students.

Methodology

The current study employed a quantitative research design to delve into the multifaceted challenges encountered by students with hearing and visual impairments, as perceived by their lecturers. In adopting a non-experimental methodology, the primary aim was to comprehensively identify and understand these challenges within the context of higher education. The research instrument utilized for data collection was a meticulously crafted Google Form-based survey, to capture nuanced insights from lecturers who have direct experience teaching students with hearing and visual impairments.

Commencing in March 2023, this data collection endeavour targeted lecturers from diverse faculties within UiTM, ensuring a broad representation across academic disciplines. Participants were tasked with providing their perspectives on the obstacles faced by students with hearing and visual impairments throughout their academic journey. Leveraging the expertise of Hayes (2014), the survey instrument underwent adaptation to suit the specific context of UiTM and the objectives of this study. The survey questionnaire comprised three distinct sections strategically designed to explore various facets of the challenges encountered by students with sensory impairments. The first section focused on gathering demographic information, providing valuable context for interpreting the subsequent responses. Following this, sections B and C were dedicated to identifying and elucidating the specific hurdles faced by UiTM students with visual and hearing impairments during online learning sessions, respectively.

To accommodate lecturers who primarily interact with students possessing a single type of impairment, respondents were granted the flexibility to omit sections pertaining to the other impairment type. This tailored approach ensured the collection of relevant and meaningful data pertinent to each participant's instructional context. With a total of 29 meticulously crafted items, the questionnaire encompassed a comprehensive range of potential challenges, ensuring a thorough exploration of the topic. Leveraging the user-friendly interface of Google Forms, the survey was seamlessly administered to participants, facilitating efficient data collection and minimizing logistical barriers.

Upon completion of data collection, the amassed dataset underwent rigorous analysis using the Statistical Package for the Social Sciences (SPSS) software, version 27.0. This analytical phase aimed to extract actionable insights and discern meaningful patterns within the collected data, thereby contributing to a deeper understanding of the challenges faced by students with sensory impairments in the academic realm. Overall, this meticulously designed research endeavour represents a concerted effort to shed light on the obstacles impeding the educational experiences of students with hearing and visual impairments, as perceived by their lecturers. Through robust methodology and comprehensive data analysis, this study endeavours to inform evidence-based interventions and policy initiatives aimed at fostering inclusivity and equitable educational opportunities for all learners.

Result and Discussion

This finding provide valuable insights into the challenges faced by UiTM students with hearing and visual impairments during online learning, highlighting the unique barriers they encounter in this educational setting from educators' point of view. Table 1 below presents the demographic data of the study.

Table 1: Demographic data

Variables	Values	Frequency	Percentage (%)
Gender	Male	4	13.3
	Female	26	86.7
	Total	30	100
Age	18 – 30 years old	1	3.3
	31 – 40 years old	14	46.7
	41 – 50 years old	10	33.3
	> 51 years old	5	16.7
	Total	30	100
Race	Malay	29	96.7
	Chinese	1	3.3
	Total	30	100
Religion	Islam	29	96.7
	Buddha	1	3.3
	Total	30	100
Marital Status	Single	6	20.0
	Married	23	76.7
	Others	1	3.3
	Total	30	100
Education Level	Bachelor's degree	1	3.3
	Master	24	80.0
	Doctor of philosophy	5	16.7
	Total	30	100
Faculties	Academy of Language Studies	7	23.3
	Academy of Contemporary Islamic Studies	1	3.3
	Faculty of Law	2	6.7
	Faculty of Applied Science	1	3.3
	Faculty of Business and Management	6	20.0
	Faculty of Information Management	1	3.3
	Faculty of Sports Science and Recreation	1	3.3
	College of Creative Arts	5	16.7
	College of Computing, Informatics and Mathematics	3	10
	College of Engineering	1	3.3
	College of Build Environment	2	6.7
	Total	30	100
Campus	Kampus UiTM Shah Alam, Selangor	12	40.0
	Kampus UiTM Puncak Alam, Shah Alam	1	3.3

	Kampus UiTM Arau, Perlis	1	3.3
	Kampus UiTM Dungun, Terengganu	1	3.3
	Kampus UiTM Sri Iskandar, Perak	1	3.3
	Kampus UiTM Sungai Petani, Kedah	4	13.3
	Kampus UiTM Bukit Mertajam, Pulau Pinang	1	3.3
	Kampus UiTM Alor Gajah, Melaka	4	13.3
	Kampus UiTM Tapah, Perak	2	6.7
	Kampus UiTM Rembau, Negeri Sembilan	1	3.3
	Kampus UiTM Bandaraya Melaka, Melaka	1	3.3
	Kampus UiTM Seremban 3, Negeri Sembilan	1	3.3
	Total	30	100

Table 1 presents the demographic breakdown of the study participants, totalling 30 individuals. Among of the lecturers surveyed, there were 4 males and 26 females. Regarding age distribution, 1 lecturer was between 18 and 30 years old, 14 lecturers were between 31 and 40 years old, 10 lecturers were between 41 and 50 years old and 5 lecturers were above 51 years old. In terms of racial diversity, the study comprised 29 Malay lecturers and 1 Chinese participant. Regarding religious affiliation, 29 lecturers identified as Muslim, while 1 lecturer identified as Buddhist. Marital status varied, with 6 lecturers being single, 23 lecturers married, and 1 lecturer widowed. Educational attainment showed a distribution of 1 lecturer with a bachelor's degree, 24 lecturers with master's degrees, and 5 lecturers holding doctorates. Across different faculties, participation was as follows: 7 lecturers from the Academy of Language Studies, 2 lecturers from the Faculty of Law, 6 lecturers from the Faculty of Business and Management, 5 lecturers from the College of Creative Arts, 3 lecturers from the College of Computing, Informatics, and Mathematics, 2 lecturers from the College of Built Environment and 1 lecturer from five other faculties. Regarding campus affiliation, the highest number of lecturers, 12, came from the Shah Alam Campus, followed by 4 from the Sungai Petani, Kedah Campus, 4 from the Alor Gajah, Melaka Campus, 2 from the Tapah, Perak Campus, and 1 lecturer from eight other campuses.

Visual Impairment

The collected data are presented in the table below. Table 2 shows the data from lecturers teaching students with visual impairments.

Table 2: Result for visual impairments

Variables	Values	Frequency	Percentage (%)
Is there any advanced notice by the faculty that you will be teaching students with visual impairments?	YES	13	43.3
	NO	12	40.0
	NO ANSWER	5	16.7
	Total	30	100

Variables	Values	Frequency	Percentage (%)
	1 week - 2 weeks	10	33.3

How long advance notice is needed to convert your course materials into an alternate format?	2 weeks - 3 weeks	7	23.3
	>3 weeks	8	26.7
	No answer	5	16.7
	Total	30	100

Variables	Values	Frequency	Percentage (%)
Have the learning materials used by your students have been converted to an electronic readable format?	YES	14	46.7
	NO	11	37.7
	NO ANSWER	5	16.7
	Total	30	100

Variables	Values	Frequency	Percentage (%)
Does the faculty / college provide assistive technology to students for learning and assessment purposes?	YES	1	3.3
	NO	24	80.0
	NO ANSWER	5	16.7
	Total	30	100

Variables	Values	Frequency	Percentage (%)
Are students given extra time during examinations?	YES	22	73.3
	NO	3	10.0
	NO ANSWER	5	16.7
	Total	30	100

Variables	Values	Frequency	Percentage (%)
If YES, how much time are given?	30 minutes – 1 hour	14	46.7
	1 hour – 1 hour 30 minutes	5	16.7
	> 2 hours	2	6.7
	No answer	9	30.00
	Total	30	100

Teaching students with visual impairments at the university level presents unique challenges that need to be addressed in order to ensure equal access to education (Tom *et al*., 2018). Based on current study, 25 out of 30 lecturers have experienced teaching students with visual impairments in UiTM.

In accordance with variable one "Is there any advanced notice by the faculty that you will be teaching students with visual impairments," 12 lecturers, constituting approximately 40%, indicated that they received no prior notification from the faculty regarding teaching visually impaired students in their classes. This lack of advanced notice can hinder their early preparation and readiness in providing appropriate teaching tools and accommodations for visually impaired students (Edyburn, 2000).

For variable two, "How long advance notice is needed to convert your course materials into an alternate format?", the highest answer was "1 week – 2 weeks" (33.3%), followed by" ">3 weeks" (26.7%) and "2 weeks – 3 weeks" (23.3%). This emphasizes the need for thorough preparation to develop effective teaching tools in this aspect. Additionally, it is crucial to prepare the tactile and audio materials to facilitate learning for individuals with visual impairments, indicating that adequate time and effort need to be dedicated to creating these resources (Levent Zorluğlu *et al*., 2021). Overall, the preparation of teaching tools for visually impaired students is a multifaceted process that involves creating tactile materials and addressing various subjects during online learning. While the exact duration in weeks for this preparation may vary depending on the specific context and resources available, these studies collectively emphasize the importance of thorough and comprehensive preparation to effectively support students with visual impairments in their online learning journey.

The third variable assessed whether learning materials used by students had been converted to an electronic readable format. Out of the respondents, 46.7% affirmed that they had undertaken this conversion, indicating a proactive approach to accommodate students with visual impairments. Conversely, 37.7% indicated that they had not converted the materials. This discrepancy suggests that while many lecturers have adapted materials, some may not have been adequately informed or prepared to do so, possibly due to a lack of prior notification from the faculty regarding the presence of visually impaired students in their classes. Addressing this issue is crucial as it underscores the importance of tailoring learning activities and materials to students' diverse needs, including physical conditions. By analysing students' learning requirements and potential challenges, lecturers can effectively devise strategies to support the learning process (Kizilaslan *et al*., 2021).This arises from the necessity for students to potentially require adaptations such as advance and graphic organizers, instructional scaffolding, additional practice and time for assignment completion, and/or alternative media formats example like large-print materials, audiotapes, or electronic formats (Clabough *et al*., 2017). Variable number four, pertains to whether the faculty or college furnishes assistive technology to students for learning and assessment objectives. Only 3.3% of respondents affirmed that such provision exists, indicating that the faculty or college indeed offers assistive technology for these purposes. Conversely, a substantial 80% reported that no such provision is in place. Assistive technology encompasses any tools or devices utilized to enhance, sustain, or enhance the abilities of individuals with disabilities, as per the Individuals with Disabilities Education Act (IDEA) of 2004 (Wright and Wright, 2006). Its significance in special education lies in its capacity to provide tailored instructional support, as many students with disabilities require specialized educational interventions (Sze, 2009). Various assistive technology devices and software are accessible and can be advantageous for students with disabilities when utilized with meticulous planning and direction (Duhaney and Duhaney, 2000).

In response to variable number five, "Are students given extra time during examinations?", 73.3% of respondents answered affirmatively, indicating that extra time is allocated for visually impaired students during examinations. Only 10% of participants indicated otherwise. For those who answered affirmatively, they were asked to provide a response to variable number six, "How much time is given?", 46.7% indicated "30 minutes – 1 hour," 16.7% lecturers with "1 hour – 1 hour 30 minutes," and 6.7% chose "> 2 hours". The majority opted for providing extra time due to the precedent set during the Covid-19 pandemic. The Unit Perkhidmatan OKU (UPO) at UiTM is tasked with devising new policies that ensure reasonable accommodations for disabled students during open distance learning (ODL), preventing them from being disadvantaged. It is crucial to consider that individuals possess varying levels of usable vision and proficiency in utilizing alternative reading methods. While double or triple time may suffice for many braille or cassette users, imposing such strict time limits could unfairly disadvantage those who are less adept at employing these techniques (Packer, 1989). Formerly, the evidence indicates that providing 100% additional time did not yield any benefits for visually impaired learners under scrutiny which suggest that they were unable to complete their exams within the allocated time (Matobako and Molahloe, 2023). These findings contradict the perspective of certain studies that advocate for extended time for learners facing substantial impairments during assessments. It is evident that the contextual aspect needs to be carefully considered, as extended time may not address situations

where learners struggle to access information provided in the question papers. Further research is required to enhance understanding of this issue.

Hearing Impairment

Table 3 below presents data from lecturers teaching students with hearing impairments.

Table 3: Results for hearing impairments

Variables	Values	Frequency	Percentage (%)
Is there any advanced notice by the faculty that you will be teaching students with hearing impairments?	YES	3	10.0
	NO	5	16.7
	NO ANSWER	22	73.3
	Total	30	100

Variables	Values	Frequency	Percentage (%)
How long advance notice is needed to convert your course materials into an alternate format?	1 week - 2 weeks	4	13.3
	2 weeks - 3 weeks	1	3.3
	>3 weeks	3	10.0
	No answer	22	73.3
	Total	30	100

Variables	Values	Frequency	Percentage (%)
Have the learning materials used by your students have been converted to an electronic readable format?	YES	6	20.0
	NO	2	6.7
	NO ANSWER	22	73.3
	Total	30	100

Variables	Values	Frequency	Percentage (%)
Does the faculty / college provide assistive technology to students for learning and assessment purposes?	YES	1	3.3
	NO	7	23.3
	NO ANSWER	22	73.3
	Total	30	100

Variables	Values	Frequency	Percentage (%)
Are students given extra time during examinations?	YES	6	20.0
	NO	2	6.7
	NO ANSWER	22	73.3
	Total	30	100

Variables	Values	Frequency	Percentage (%)
If YES, how much time are given?	30 minutes – 1 hour	2	6.7
	1 hour – 1 hour 30 minutes	3	10.0
	> 2 hours	1	3.3
	No answer	24	80.0
	Total	30	100

Based from the current study, among a group of 30 lecturers, only 8 individuals have previously taught students with hearing impairments. In alignment with variable number one, "Is there any advanced notice by the faculty that you will be teaching students with hearing impairments?", only 3 lecturers, constituting 10.0%, responded affirmatively, while the remaining 5 lecturers, comprising 16.7%, answered negatively. University students with hearing impairments encounter numerous obstacles in their pursuit of higher education. A prior investigation indicates various primary themes delineating obstacles to and successful strategies for classroom lectures and participation. These include the vital role of accommodations in improving access to academic information comprehensively and their influence on academic outcomes, thereby fostering academic success (Porter-Vaughn, 2022). Therefore, it is crucial for faculty to provide advanced notice when lecturers will be teaching students with hearing impairments.

Regarding variable number two, "How much advance notice is required to convert your course materials into an alternate format?", the most common response was "1 week – 2 weeks" at 13.3%, followed by ">3 weeks" at 10.0%, and "2 weeks – 3 weeks" at 3.3%. While attending class, students with hearing impairment face academic and social vulnerabilities. Collaborating with students, their families and specialists is crucial for educators to tailor programming and incorporate alternative communication methods like sign language, lip reading, visual aids, and hearing devices (Mpofu and Chimhenga, 2013). Hence, the precise timeframe for preparing teaching materials and tools for hearing-impaired students relies on the particular context and the resources at hand.

The third variable examined whether lecturers had converted their learning materials into an electronic readable format. Among the respondents, 20.0% confirmed they had conducted this conversion, demonstrating a proactive effort to cater to students with visual impairments. In contrast, 6.7% stated they had not undertaken the conversion. Prior preparation is crucial before commencing teaching for students with hearing impairments. Effective teaching encompasses various skills, including maintaining high levels of student engagement through adept classroom and time management, adapting learning to students' current comprehension levels, stimulating higher-order thinking, and fostering encouragement and support to ensure success (Jordan *et al*., 2009).

Regarding the fourth variable, which inquired whether the faculty or college offers assistive technology to students with hearing impairment for learning and assessment, only 3.3% lecturers affirmatively, while the remaining 23.3% answered negatively. In this modern era, computer technology has gained prominence for its role in assisting students with hearing impairments in academic settings. Advancements in computer technology have facilitated the creation of advanced devices aimed at aiding the approximately two million students with severe disabilities that includes students with hearing impairments (Hasselbring and Glaser, 2000). Despite the considerable potential of technology to benefit students with hearing impairments in their academic pursuits, insufficient training of lecturers and cost constraints may contribute to the negative response.

In response variable number five, "Are students given extra time during examinations?", 20.0% of respondents answered affirmatively to whether students receive additional time during examinations,

while 6.7% responded negatively. Respondents who answered yes were further queried about the amount of additional time given during examinations for variable number six. Specifically, 6.7% reported a time frame of 30 minutes to 1 hour, 10.0% indicated 1 hour to 1 hour 30 minutes, and 3.3% selected more than 2 hours. A prior investigation identified four obstacles encountered by students with hearing impairments, including issues with hearing devices, difficulty comprehending lessons due to disruptions, lack of familiarity with online devices, and emotional distress experienced during online classes (Krishnan *et al*., 2020). Moreover, individuals who are deaf typically exhibit reduced cognitive processing speed, limited problem-solving abilities, and lower academic performance (Chen *et al*., 2021). Consequently, they often require additional time to fulfil various tasks, such as reading, performing mathematical calculations, listening, and taking notes (Krasavina *et al*., 2022). The extent of additional time allocated during examinations should be contingent upon the severity of the student's hearing impairment.

Conclusions and Recommendations

This study highlights the challenges faced by UiTM students with hearing and visual impairments during online learning, based on lecturers' perspectives. Major issues include inadequate notification for lecturers about teaching students with disabilities, leading to poor preparation and accommodation. There are also significant delays in converting teaching materials into accessible formats and providing assistive technologies. For visually impaired students, accessing tactile and audio materials is particularly problematic. These delays hinder their academic progress and participation in real-time learning activities, causing knowledge gaps and negatively impacting their educational experience and outcomes students.

Additionally, the distribution of assistive technology, which includes devices like screen readers, braille note-takers, and text-to-speech software, appears to be inconsistent and insufficient across the university. This inconsistency can create significant disparities in learning experiences among students with visual impairments, depending on their access to such technologies. Moreover, the necessity for extended time during assessments further illustrates the broader systemic challenges. These accommodations are essential for levelling the playing field, allowing visually impaired students the necessary time to navigate and respond to test materials using their assistive devices. The need for such measures signals a critical requirement for institutional strategies that not only address immediate accessibility issues but also consider the holistic support needs of visually impaired students to truly achieve equitable learning opportunities.

The challenges faced by students with hearing impairments at UiTM are strikingly similar to those encountered by their peers with visual impairments, particularly in terms of the insufficient advance notice given to lecturers. This lack of prior notification is a critical shortfall as it directly affects the quality of communication and the overall learning experience within the classroom. Without advance notice, lecturers are often unprepared to modify their teaching methodologies or to deploy necessary resources that facilitate effective communication, such as sign language interpreters, real-time captioning services, or enhanced auditory systems that could significantly mitigate these barriers. The absence of these accommodations can severely limit the engagement of students with hearing impairments, preventing them from participating fully in class discussions and accessing verbal instructions or discussions as seamlessly as their hearing counterparts.

Recognizing the importance of alternative communication methods and tailored educational interventions is therefore essential in transforming the academic landscape for these students. Tailored interventions may include the systematic use of visual aids, ensuring all audio content is accompanied by transcripts, or the integration of sign language within the classroom. Such measures not only aid in communication but also enrich the learning environment, making it inclusive and responsive to the diverse needs of all students. Effective implementation of these strategies requires a concerted effort from both faculty and administration to foster an educational setting that not only anticipates the needs

of students with hearing impairments but actively works to meet them, thereby enhancing academic outcomes and ensuring equity in educational opportunities.

The findings from this study underscore the necessity for UiTM to adopt a more proactive stance in its approach to supporting students with disabilities. This entails a comprehensive strategy involving the establishment of clear and robust policies that ensure timely advance notifications are provided to faculty about the presence of students with disabilities in their classes. Such notifications are pivotal for preparing educators to tailor their instructional methods and materials to suit the unique needs of these students, thereby enhancing their learning experience.

Significant investment in technology and faculty training is crucial for educational inclusivity. Advanced tools for the visually and hearing impaired, alongside faculty training in their use and inclusive teaching practices, are essential. Ensuring timely adaptation of learning materials into accessible formats like braille, large print, audio, and captioned videos is vital to avoid delays in access. These measures align UiTM with global best practices, demonstrating commitment to an inclusive environment where all students, including those with disabilities, can succeed. This research highlights the need for institutional changes and further studies on students' experiences to improve educational accessibility.

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