



Article

Resilient voices: Navigating academic and social barriers among hard-of-hearing students in higher education

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Abstract: Students who are Deaf and Hard of Hearing (DHH) face a range of social challenges that may affect their academic engagement and integration into university life. Although there is an increasing interest in the topic of inclusive higher education in the world, there is a lack of empirical studies that would analyse the social experiences of DHH students in the framework of Arab universities. This study examines the academic and social challenges faced by Deaf and Hard of Hearing students at a Jordanian university. A purposive sample of 38 male and female students. Data were collected using a structured questionnaire, with the assistance of a sign language interpreter. The results showed that DDH students face notable challenges, particularly in language proficiency, written communication, and building social relationships with non-DHH peers. Statistical analysis confirmed significant gender-based differences in the challenges reported. Qualitative findings highlighted several potential solutions, including developing students' self-skills and introducing institutional strategies tailored to their needs. The study contributes to a clearer understanding of DHH students' experiences in higher education and emphasises the importance of academic resilience in overcoming barriers. It also stresses the need for inclusive educational environments supported by flexible systems and adequate resources. These findings have meaningful implications for university policies aiming to enhance accessibility and equity. Further research is recommended to explore and evaluate effective practices that promote academic achievement and social inclusion among DHH students in university settings.

Keywords: hard of hearing, sociology, social challenges, university students.

Introduction

Over 5% of the world's population – or 430 million people – require rehabilitation to address their disabling hearing loss (432 million adults and 34 million children). One in every ten individuals, or more than 700 million individuals, is projected to have debilitating hearing loss by 2050 (Kushalnagar, 2019). Deaf and hard of hearing individuals and societies continue to face significant obstacles (Andrew et al., 2023; Cao et al., 2023; Kim et al., 2023; Fernandes et al., 2023). The academic underachievement of the DHH community has been widely acknowledged for quite some time. Despite the implementation of legislative measures by nations to safeguard the rights of these individuals, this matter persists. In 2020, the high school achievement rate for the deaf in the United States was 84.7%, 5.9% lower than the rate for the hearing, which was 89.4%. Particularly alarming are these numbers among the deaf disabled population, specifically those who are deaf and have another disability, given that their high school graduation rate is lower than that of deaf individuals without disabilities. Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 mandate that all higher education institutions, public and private, provide accessible facilities and programmes for individuals with disabilities, including the DHH, in the United States. In the case of the DHH, these accommodations consist of sign language interpreters, transcribers, captioning, and other services that are provided at the discretion of the individual and not for the convenience of the programme.

Hearing-impaired individuals DHHs encounter a dual challenge in assimilating into a society structured around hearing impairments; this results in exclusionary conditions and deteriorating mental, physical, and social well-being. The degree of awareness and support for this particular group in these societies differs depending on the dominant values, customs, and standard of living (Leigh & Crowe, 2015). However, as a result of swift social and technological advancements, improved research methods, and the focus of local and international civil society organisations, there is an increased opportunity to empower and assist this group as well as other marginalised groups within society. To transform this demographic dividend and its energies into productive forces that effectively contribute to the development process and contend with their healthier peers in society, contemporary society has placed greater emphasis on developing the capabilities of this group (Napoli et al., 2015; Andersen et al., 2018; Heyko et al., 2018). Empowering individuals with special needs is a crucial concern in the realm of development. It is a waste of human resources to disregard the empowerment of individuals with special needs (Aly & Khalil; Morgan, 2023; Burhani & Prasetyo, 2023; Albash, 2023).

Disabled individuals experience a range of consequences that transcend their personal lives, including physical impairments, compromised health, and social integration within their communities (Holzinger et al., 2022; Bennett et al., 2022; Inguscio et al., 2023; Wonkam et al., 2022). Healthily, socially, and economically, hard-of-hearing (deaf) individuals must be empowered to achieve their maximum potential. To this end, a variety of social programmes and policies must be implemented at various levels, taking into consideration the facets of disability. These policies and programmes should include special education initiatives, therapeutic interventions, and rehabilitation (Schilder et al., 2019; Punch et al., 2019; Holman et al., 2019 & Lieu et al., 2020). The efficacy and triumph of these initiatives are contingent upon their capacity to accommodate a substantial number of individuals with disabilities and their families, ultimately aiding individuals with disabilities in adjusting and ensuring their ability to reside autonomously within a compassionate household and a collaborative community, while also enabling them to participate fairly in all facets of society—as is the fundamental right of individuals with disabilities (Arcous Individual worth is not determined by their physical and physiological conditions, but rather by the extent to which their fundamental social rights as citizens are upheld, with the right to receive a suitable and efficient education in an authentic learning environment being the most critical (Al-Khateeb, 2011 & Alhrahshah, 2023).

All 22 member states of the League of Arab States have ratified international conventions and treaties about the rights and integration of individuals with disabilities across all spheres of life, including education, employment, society, and civil and political spheres. Education for explicitly deaf pupils in Arab countries is frequently restricted to the secondary level. Brown (2020) identifies the lack of infrastructure to promote inclusion as a significant concern, particularly in Arab states where sensory disabilities (e.g., DHH) are frequently disregarded for the reason that special education accommodations are not generally necessary.

This study brings the experiences of the academic challenges faced by DHH students at Jordanian University by bringing on board their experiences and perspectives. In their pursuit of a university degree, DHH students encounter distinct obstacles in comparison to their hearing counterparts. Moreover, the attainment of HE holds greater importance for this demographic as it affords these students the chance to cultivate abilities that enhance their capacity to assimilate into the hearing-dominated community at large. We investigated social and academic challenges faced by DHH students at Jordanian University through a non-random sample of 38 male and female students, who were in their first semester of the

2020-2021 academic year. Several Arab universities have recently initiated initiatives to assist DHH students in higher education, according to our research. In the case of DHH students at Jordanian University, they are granted equal admission to numerous academic disciplines as their hearing counterparts. The current study with the help of a questionnaire gauges their experiences and perspectives and suggests supportive solutions to overcome challenges in the university environment. The results of this study contribute to a better understanding of the experiences of DHH students in higher education and highlight the importance of success in overcoming academic challenges.

This research holds great importance as it investigates a worldwide societal concern that impacts a substantial demographic, comprising 15% of the world's population, namely DHH. Moreover, the study's significance is demonstrated by the additional knowledge it imparts to researchers with an interest in this speciality. Additionally, it provides universities and various private and public sectors with information regarding the obstacles that impede the progress of individuals with disabilities, specifically those with hearing impairment, so that they may employ more scientific and objective approaches to facilitate positive and appropriate interactions with them. This, in turn, empowers them to acquire the means to earn a livelihood and secure a means of subsistence.

DHH adoption and integration into society are in general challenging for students, but this is especially true in Arab societies, which continue to lack the appropriate laws and regulations necessary to construct a society in which they can interact with all of their capabilities and potential, live a decent life, and overcome the stigmatising and pity-filled gaze. Notwithstanding these obstacles, a cohort of deaf students persists in integrating into society and engaging in competition with able-bodied individuals in fields such as social work and other occupations. Furthermore, they contend with their peers in academic institutions, universities, and diverse extracurricular engagements (Bolshakov and Walker, 2022). Despite the university's provision of humanitarian services to this student body, further attention and diligence are required. By investigating empirically the experiences and perspectives of deaf university students, this study examined how they employ resilience and success strategies to surmount academic obstacles. The primary objective of the research, which examines the behaviours and abilities of deaf students, is to facilitate their integration into the social milieu of the university. The research addresses the prevailing assumptions regarding how DHH students can surmount academic obstacles by employing resilience and success strategies.

The subsequent four sections comprise the body of the paper. In section two, recent literature pertaining to hearing impairment, the function of inclusive education for DDH, and the obstacles encountered is reviewed in detail. The research methodology that was utilised is described in Section 3. Subsequently, in Section 4, the analysis and discussions are presented. The research study is ultimately concluded in Section Five, which provides policy recommendations for improved environments.

Problem

Deaf and hard-of-hearing students encounter numerous challenges in various aspects of life, particularly within the university environment, where academic and social difficulties are especially pronounced. Many higher education institutions fall short in providing the appropriate infrastructure, assistive technologies, and inclusive services needed to support this group effectively. Such shortcomings significantly hinder the academic performance and social integration of DHH students. Accordingly, this study seeks to address a central question: *What are the key academic and social challenges faced by deaf and hard-of-hearing students in university settings?*

Questions & hypothesis

Q1: What are the Academic Challenges Faced by DDH Students?

Q2: What are the Environmental Challenges Faced by DHH Students in the University?

Q3: What are the Social Challenges Faced by DHH Students in the University?

Q4: What are the Economic Challenges Faced by DHH Students in the University?

H0: There are statistically significant differences in the average academic and social challenges faced by Deaf and Hard-of-Hearing (DHH) students based on gender.

Literature Review

Hearing loss is one of the most common health conditions globally, leading to difficulties in interpreting sounds and reduced communication with others. This, in turn, can result in significant social and economic challenges for individuals (World Health Organization, 2012; Forman, 2002). The severity of hearing loss ranges from mild to profound, and in some cases, it may lead to complete deafness. Hearing loss is also defined as a condition in which a person retains just enough hearing to communicate with others (Ravi, 2008; Mahwesh, K., 2012). Research indicates that individuals who are classified as deaf typically experience a non-functional level of hearing, usually exceeding 70 decibels, which significantly

affects their daily lives and educational experiences (Susan et al., 2008; Patten, 2013; Mahwesh, K., 2012).

Modern societies are placing increasing emphasis on educating adolescents in general, and those with special needs in particular, by developing appropriate curricula and establishing dedicated social and educational institutions. Governments are also committed to integrating these individuals into society and are therefore obliged to provide a supportive social and welfare environment that prioritises their health and well-being. Many organisations advocate for a comprehensive, multidimensional model of health as essential to achieving a good quality of life. This includes improvements in health, income, psychological well-being, culture, and education. Naturally, access to quality education has a consistently positive impact on individuals with special needs. (Rafi, 2008; Mahwish, K., 2012; Mahwish, K., 2012; Asrat, 2013).

DDH students encounter significant challenges throughout their academic journeys. Research has shown that many of these students tend to achieve lower academic grades compared to their hearing peers. In addition, they often face social difficulties, particularly due to negative attitudes from fellow students (Carrington and Robinson, 2006; Asrat, 2013; Hear-it, 2012). In contrast, studies have highlighted the need for specialised teachers who can understand the unique needs of DDH students and possess the skills to engage with them effectively and convey information clearly. The research further emphasises the importance of establishing a comprehensive educational system tailored to support this group of learners (Asrat, 2013; Gezahegn, 2013; Gezahegne and Yinebebe, 2010; Tirussew, 2005).

Others have stressed the importance of training students from this group to bridge the gap in technology and language through specialised professional development programmes, delivered in partnership with the third sector and educational institutions (Gezahegn, 2013; Carrington and Robinson, 2006; Gezahegn, 2013).

Methodology

The section gives an overview of the methodology used within the study as well as lays out the rationale behind those choices. The study aimed to investigate the academic challenges faced by DDH students at Jordanian University and thus empirically explore their experiences and perspectives. The methodology applied for this study is quantitative. Structured questionnaires have been used to gather the primary data required for the study from the DDH students at Jordanian University. A total of 38

respondents filled out the questionnaire. Although the size of the study population is not enough to apply the findings across the nation, however, it would serve as a primer for sound policy enunciations.

Sampling and Data Collection

The study has ensured that the participants qualify for the research requirements of the study in the context of the research questions of the study. The study population consists of all students with hearing disabilities at Jordanian University . All of the aforementioned students registered at Jordanian University for the academic year 2020/2021 were included in an intentional sample. The study sample consisted of (38) male and female students, with 42.1 percent male and 57.9 percent female. In terms of social status, 31.5 per cent of the respondents were married while 68.5% were unmarried, as depicted in Table 1.

Table

Frequency Distribution Based on Demographics

Variable	Frequency	Percentage	
Gender	Male	16	42.1
	Female	22	57.9
	Married	12	31.5
Social Status	Unmarried	26	68.5
	Total	38	100

Source: Data Results generated through SPSS V 22.0

After obtaining official approvals from the university administration and the person in charge of hearing-impaired students at Jordanian University, 38 respondents DDH students in the classroom were asked to fill out the questionnaires, accompanied by a sign interpreter, and they were introduced to the objectives of the study. All (38) students with hearing impairments registered for the first semester of 2020-2021 - in applied sociology and special education, have been reached.

Design and Tools of Research

The structured questionnaire in line with the study's aim is to examine and investigate the academic challenges faced by DDH students at Jordanian University. As to the approach of the study, a deductive approach is used which is in sync with the quantitative nature of the study. The descriptive approach was used in the study confining within the boundaries of the social survey method, describing the social and demographic characteristics of DDH students at Jordanian University, thereby identifying the challenges faced and attempting to provide solutions through resilience and success strategies.

A questionnaire was used to collect data for this study. The specialised questionnaire was created for this study to identify the characteristics of students and the difficulties they face in the administrative, academic, environmental, and physical areas. In addition to identifying the nature of the relationship with

academic and administrative staff, as well as able-bodied students, to achieve results that meet the study's objectives and its questions. It was created using a five-factor scale: always, frequently, occasionally, rarely, and never. The questionnaire is divided into two sections. The first relates to researching the data and personal characteristics of the study sample members and consists of variables (gender, age), while the second relates to researching the difficulties that students face and consists of 20 paragraphs that were filled out using the personal interview method.

To ensure the validity of the study tool or questionnaire, it was presented to a panel of 5 arbitrators from Al Ain University who are experts in sociology and educational sciences. To judge the tool in terms of its accuracy, language, and the extent to which the paragraphs represent the characteristics to be measured, and to achieve the objective of the study, each of them made observations, and appropriate modifications were made based on their observations, and the number of paragraphs of the questionnaire in its final form reached 18 questions distributed across all fields. To ensure the questionnaire's reliability, the consistency coefficients (Cronbach's Alpha) method for each dimension were calculated, as well as the internal consistency coefficient for the scale as a whole. The coefficient value was (0.927), which is significant given that the tool is reliable and also makes it appropriate for this study (see Table No. 2).

Table 2

Reliability Analysis

No	Factors	Number of Items	Cronbach's Alpha	Validity
1	Academic Challenges	4	0.771	0.881
2	Environmental Challenges	6	0.827	0.915
3	Social Challenges	8	0.764	0.886
4	Economic Challenges	9	0.726	0.852
Total		27	0.927	0.962

Source: Data Results generated through SPSS V 22.0

Measures

Descriptive statistical measures were employed in this study to analyse the data and answer the research questions. Frequencies and percentages were used to describe the demographic characteristics of the study sample. Additionally, means and standard deviations were calculated to explore the participants' responses to the research variables and to identify general trends in the data. To test the study hypothesis, an independent samples t-test was conducted to examine whether there were statistically significant differences between the groups under study. The significance level was set at $\alpha = 0.05$.

ETHICS/Institutional Review Board Statement

This research uses primary data collected from participants with a commitment to confidentiality and anonymity, so the authors sought to respect the preliminary findings of the included articles and the participants involved.

Results

This section reports the findings that we obtained by synthesising the outcomes of the questionnaire, based on the scope of two research questions asked in this study.

First question result: What are the Academic Challenges Faced by DDH Students?

Table 3

Academic Challenges Faced by (DHH) Students with Online Mode of Learning

Item	Mean	Std. Deviation	Item Importance	Importance Level
I do not prefer online courses	3.8	2.7	1	High
I cannot concentrate because I am at home with the family	3.7	2.9	2	High
I find it difficult to participate	2.3	1.2	3	Medium
I find it difficult to solve online exams	1.8	1.0	4	Low
Total	2.9	1.95		High

Source: Data output from SPSS v 22.0

Table 3 shows the means and standard deviations for the answers of the study sample (students with DDH) on the prompts of the scale of academic challenges faced by them. The analysis suggests that the DDH don't prefer online classes, with a mean of 2.8 and a standard deviation of 2.7. Other challenges that impact the learning of DDH students are the inability to concentrate (mean, 3.7; standard deviation, 2.9), participation difficulty (mean, 2.3; standard deviation, 1.2), and difficulty in solving online exams (mean, 1.8; standard deviation, 1.0). The results show that the academic challenges faced by DDH students with an online mode of learning were at a high level. These results concur with the results of Mulwafu, Kuper, & Ensink, (2016) and Emmett and Francis (2015); which found academic challenges along with economic challenges as the prominent ones.

Second question result: *What are the Environmental Challenges Faced by DDH Students in the University?*

On inquiring about the most prominent social challenges that are associated with students' relationships with their healthy peers and teachers at the university along with the environmental challenges faced by students with DDH at the university. The responses are illustrated in Table 4 as follows.

Table 4

Mean and Standard Deviations of *the Environmental Challenges Faced by (DHH) Students in the University*

Item	Mean	Std. Deviation	Item Importance	Importance Level
There are no assistive technology tools	4.6	2.9	1	High
Corridors are narrow	1.6	1.3	2	Low
The lighting is bad	1.4	1.0	3	Low
The classrooms are small	1.8	0.6	4	Low
There is not enough ventilation	1.6	0.5	5	Low
The cooling system is bad	1.1	0.4	6	Low
Total	2.01	1.28		Low

Source: Data output from SPSS v 22.0

Table 4 shows that the environmental challenges facing the DDH were at the low level and the values for the participants about these environmental challenges were from (4.6 – 1.1) which is between high to low. The first statement (There are no assistive technology tools) ranked first with (4.6 mean and 2.9, Std. Deviation) has a high importance level, and thus asserts that the environmental challenges faced by DHH affect their learning capacity. Looking at other statements of the environmental challenges, the respondents have highlighted a minuscule role in terms of their impact on their academic learning.

Third question result: *What are the Social Faced by (DHH) Students in the University?*

Table 5

Social Challenges Faced by (DHH) Students in the University

Item	Mean	Std. Deviation	Item Importance	Importance Level
Some professors do not take into account our special conditions.	3.6	2.9	1	High
Professors do not cooperate with us.	3.2	2.8	3	Medium
We find it difficult to reach the administration.	1.6	2.2	7	Low
We cannot contact the professors after the lesson.	1.5	2.4	5	Low
Difficulty in creating relationships with able-bodied students.	4.6	2.9	2	High
Negative perception by able-bodied students.	3.7	2.8	4	High
Lack of knowledge of sign language among able-bodied students.	3.6	2.4	6	Low
Lack of cooperation of able-bodied students.	1.8	2.0	8	Low
Total	2.47	2.55		High

Table 5 presents the social challenges faced by members of the study population, with mean scores ranging from 1.5 to 3.6. The statement “Some professors do not take into account our special circumstances” received the highest mean score of 3.6. This finding aligns with the study conducted by Holman, Drummond, Hughes, and Naylor (2019).

Fourth Third question result: What are the Economic Challenges Faced by (DHH) Students in the University?

Table 6

Means and Standard Deviations for Economic Challenges Faced by (DHH) Students in the University

Item	Mean	Standard deviation	Item Importance	Importance Level
I feel that my family is suffering from my expenses as deaf and hearing-impaired	3.54	0.85	1	High
I have no financial capabilities to join training programs to communicate with the deaf and hearing impaired.	3.43	0.85	2	High
Financial expense is not enough for me	3.41	0.9	3	High
I am suffering from my inability to buy the appliances & the software I need.	3.29	1.21	4	High
I do not have financial capabilities to go in recreational trips.	3.25	1.09	5	High
I don't receive any financial assistance from anyone.	3.23	0.84	6	High
I am unable to regularly visit a doctor/private hospital due to cost.	2.8	0.93	7	Medium
I do not get involved in sport & social activities that I like because of its financial cost.	2.61	0.98	8	Low
I do not practice my hobbies because of my financial situation.	2.26	0.69	9	Low
I can't visit some of my deaf friends because of transportation cost.	2.18	0.69	10	Low
Total	3	0.9		High

The mean values as indicated in Table 6 signify that the economic challenges encountered by DDH individuals were moderate. The response rates of the participants ranged from 3.55 to 2.18, which falls within the range of Medium to Low. Statement (3), "My family is bearing the burden of my deaf and hearing-impaired expenses," received the highest score of 3.55 out of 5.00, placing it in the Medium category. Statement (7), "Transportation costs prevent me from visiting some of my As highlighted by Emmett and Francis (2015), this coincides with the effect of hearing loss on the economic status and income rate of the affected population relative to their counterparts (Mulwafu, Kuper, & Ensink, 2016; Punch, 2016; Jung and Bhattacharyya, 2012).

Hypothesis result: There are statistically significant differences in the average academic and social challenges faced by DDH students based on gender

The study further employed one Sample T-test to determine whether the DDH students are facing academic, social and economic challenges or not, categorised based on gender. The presentation of the data related to the question is justified based on the Study Hypothesis.

The hypothesis states that “If there are any statistically significant differences at the significance level ($\alpha \leq 0.05$) in the challenges faced by students with hearing disabilities, due to the gender variable”.

Table 7

Results of One-Sample T-Test for Academic, Social, and Economic Challenges Faced by (DHH) Students According to Gender

Challenges	Gender	Mean	Std. Deviation	(T) value	Statistical Significance
Academic challenges faced by students with disabilities.	Male	3.62	1.38	4.634	0.132
	Female	2.21	1.14		
Environmental challenges faced by students with hearing disabilities.	Male	3.52	1.12	1.563	0.237
	Female	3.25	1.06		
Social challenges in the relationship between students with hearing disabilities and the teaching and administrative bodies at the university; and hearing disabilities and their peers from ordinary students.	Male	2.21	0.38	1.272	0.168
	Female	2.34	0.84		
Economic challenges faced by DHH Students	Male	2.15	1.02	0.506	0.119
	Female	2.11	0.97		
Total	Male	2.72	1.06	0.237	0.794
	Female	2.65	1.10		

Note: (t) Tabulated = ± 1.96 , (t) value = 3.00, * Significant at level of (0.05)

The results in Table (7) indicate that there are no statistically significant differences in the *Academic* difficulties faced by students with hearing disabilities at the significance level ($\alpha \leq 0.05$) due to the gender variable. This is based on the (T) value calculated in the areas of; academic, social, and economic challenges in the relationship between DDH students at the university. It is worth mentioning that the results have shown that there are statistically significant differences in the field of "academic challenges faced by students with disabilities" and they are in favour of male students. The study also revealed gender-based differences in the social challenges faced by (HHD), while no significant gender differences were found in academic or economic challenges.

Discussion

The study sought to identify the challenges facing (DHH), by referring to the analysis of data related to the responses of the study sample in the previous section. The university environment also lacks the presence of artificial and technological intelligence tools that can help DDH students to move within the campus units and benefit from academic and social services within the university, such as the library, cafeteria, deanship of student affairs and theatre. On the other hand, the physical and physical

infrastructure of the university was suitable for the DDH students. The classrooms and corridors are wide, the ventilation is good, and the halls and the cooling system are excellent as well based on the responses from the DDH respondents.

As for the nature of the relationship between students with hearing disabilities and teachers, it is clear that there are difficulties that impede this relationship, as evidenced by the teachers' lack of appreciation for the conditions of this group of students and treating them differently from the healthy students. They cannot write and memorise as healthy students, so it is essential to understand their characteristics and deal with them accordingly. This may be due to some faculty members' lack of experience with sign language and how to handle special cases, as well as the fact that they are teaching healthy students simultaneously.

About students consulting the administration and their communication with teachers outside the lesson, they do not need to consult the university administrator to learn about their academic and personal circumstances, as there is a delegate on their behalf represented by the Zayed Higher Organization in cooperation with the university administration, and they are constantly informed of any developments.

The nature of their relationship with the healthy students was very poor, which can be attributed to the healthy students' lack of awareness of sign language. Finally, the results revealed that there were statistically significant differences in difficulties ($\alpha = \geq 0.05$) due to the gender variable in the field of "academic challenges faced by students with disabilities". It was in the interest of male students that they are heads of families who work and support their families, so they spend most of their time at work, while the majority of females do not work and find enough time to study.

Conclusion

Based on the previous presentation, it appears that the study achieved its intended goals, which were to identify the challenges that deaf students may face in the university environment. The results showed that DDH students faced social and academic challenges in the university, including a lack of specialised instructors with sufficient knowledge of sign language and the significant challenge of being unable to engage in relationships with their peers due to the lack of knowledge among hearing students of sign language, which makes communication difficult.

Therefore, the study strongly encourages local and international researchers to conduct further comparable studies to identify additional challenges. Additionally, the study calls for research into the challenges that hearing students face in forming social relationships with Deaf students in order to raise

greater awareness among hearing students of the importance of this group of young people and their academic and social capabilities, and how they can be leveraged to promote the development and progress of society.

Finally, the study recommends that universities provide teachers with sign language certification and full awareness of the characteristics and capabilities of DDH students, which can reduce the challenges that this group of students may face in universities and help enhance their academic and cognitive proficiency, thereby increasing their social and economic empowerment and access to good job opportunities. In turn, this would improve their ability to integrate into the workplace and interact with hearing colleagues after graduation.

Limitations and Future Scope of the Work

While conducting a study on the challenges faced by deaf students, it is important to acknowledge and address potential limitations. Here are some common limitations that the study faced during the period. First of all, the study is based on small sample size of 38 students, which makes it challenging to generalise findings to the broader deaf student population. Besides that, the study may focus on a specific demographic, geographic or educational level which limits the applicability of results. The second limitation of the study is that deaf students use various communication methods, signs, which may not capture the full range of experiences. The study may not capture the perspectives of key stakeholders, such as educators, parents, or policymakers, which can provide a more holistic understanding of the challenges faced by deaf students. Researchers should be transparent about these limitations and consider them when interpreting and generalising the study's findings. Addressing these limitations can contribute to the overall rigor and validity of the research.

Recommendations

There is a pressing need for universities to appoint sign language interpreters in all departments where hearing-impaired students are enrolled. Institutions should also increase the number of instructors proficient in sign language to support those who are not. Teachers without sign language skills should be encouraged to attend staff development courses to acquire the necessary communication tools for effectively teaching hearing-impaired students. Moreover, educators must develop empathy toward students with hearing impairments and design inclusive activities and strategies that support their learning. It is also essential for teachers to provide course outlines, lecture notes, and handouts to interpreters in advance, enabling them to prepare adequately and assist the students more effectively. By

granting interpreters access to course materials ahead of time, they can better understand and convey the content, while also allowing students to seek support from parents or other helpers when needed.

AI acknowledgment

The researchers acknowledge the use of ChatGPT (Chatgpt.com) to modify the terms in the strategies. The prompts used include dynamic online formats, holistic learner insight through expressive task-based outputs. The output from these prompts was used to present the different strategies used by the teachers. While the authors acknowledge the usage of AI, the authors maintain that they are the sole authors of this article and take full responsibility for the content therein, as outlined in COPE recommendations.

Conflict of interest

The author declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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