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From admission to empowerment: A proposed framework for enhancing the enrollment requirements of deaf and hard-of-hearing students in higher education

Nourah Ibrahim Abdullah Albash

Special Education Department, College of Education, King Faisal University, Al-Ahsa 31982, Saudi Arabia.

(*Email: nalbash@kfu.edu.sa*)

Abstract

In light of global efforts toward achieving inclusive and equitable education for all, there is an increasing need to shed light on the current state of higher education for deaf and hard-of-hearing (DHH) students and to analyze the challenges they face in order to contribute to the development of more inclusive educational environments. The present study aimed to identify the essential requirements for enrolling deaf and hard-of-hearin (DHH) students in higher-education institutions, and examine potential differences from the perspective of teachers according to their educational qualifications and years of experience. The study employed a descriptive survey research design using a researcher-developed questionnaire administered to 61 female teachers of DHH students in Saudi Arabia (Al-Ahsa Governorate). Data were analyzed using descriptive and inferential statistics to determine teachers' perceptions. The findings revealed a high level of agreement among teachers' participants regarding the importance of all identified domains. The most critical requirements for enrolling DHH students in higher education were ranked, in descending order, as follows: requirements related to the educational process, the educational environment, faculty members, sign-language interpreters and administrative aspects, and financial requirements. No statistically significant differences were observed in teachers' views based on their educational qualifications and years of experience. The study concludes that achieving effective inclusion of DHH students in higher education requires comprehensive and coordinated efforts across multiple educational, institutional, and societal dimensions. Practically, the study proposes a framework to enhance institutional readiness by improving instructional strategies, ensuring accessible learning environments, providing qualified interpreters, Expanding Education and Training Opportunities, Effective Leadership, Infrastructure Developmen, Improving Attitudes, and allocating adequate financial resources, along with institutional and policy-level commitment, thereby supporting inclusive education in alignment with national and global goals.

Keywords: Hearing impairment, Higher education, Needs.

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Institutional Review Board Statement: The researcher ensured full compliance with the ethical standards governing educational research. The researcher obtained formal approval from the Institutional Review Board (IRB) at King Faisal University, before commencing the study. Approval for the study was obtained from along with the necessary administrative permissions from relevant authorities to facilitate data collection. The research design was carefully structured to minimize any potential risk by ensuring anonymity, all participants provided informed consent by reading and signing a consent form that explicitly stated their right to withdraw from the study at any stage without penalty. Participants were also assured that all data collected would be used solely for research purposes and handled with strict confidentiality throughout the study.
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1. Introduction

Higher education serves as a vital tool for developing and investing in human resources. Consequently, it has become essential to meet the needs of diverse societies, align with modern trends, and fulfill the requirements of national development plans. People with disabilities-including those who are deaf or hard of hearing-are partners in this developmental progress and have the right to pursue higher education alongside their hearing peers [1].

Globally, an increasing number of students with disabilities are receiving higher education within inclusive learning environments. In the United States, approximately 50% of higher-education institutions provide educational services to students with disabilities [2]. Due to significant advances in disability-related legislation, opportunities for access to post-secondary education have greatly improved. For instance, 75% of students with disabilities in the U.S. have enrolled in various types of higher-education institutions [3, 4]. According to Section 504 of the Rehabilitation Act of [5] and the Americans with Americans with Disabilities Act [6] it is mandatory to provide students with disabilities equal opportunities to enroll in postsecondary institutions and to offer reasonable accommodations [2, 7]. Under the ADA, all federally funded postsecondary institutions are required to provide services for DHH students [8].

At the Arab regional level, most Arab states have adopted international laws and conventions. All 22 member states of the Arab League have signed the major international treaties related to the inclusion of persons with disabilities and their rights across civil, social, professional, and educational domains [9]. Likewise, most have ratified the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), whose Article 24 (5) stipulates that "States Parties shall ensure that persons with disabilities are able to access general tertiary education, vocational training, adult education and lifelong learning without discrimination and on an equal basis with others" [10].

Nevertheless, all Arab nations face obstacles in implementing these laws, often due to cultural norms and socioeconomic, political, or geographic factors, as well as teacher-training limitations Imam [11]. Qabeel [12] noted that education for DHH students in Arab countries typically does not extend beyond secondary school. These students are often unable to complete higher education because they lack the prerequisites for integration into that system. Despite various initiatives to include students with disabilities in higher education, many challenges persist. Imam [11] further observed that Arab and Gulf countries in particular experience tension between rapid modernization and traditional values, customs, and social heritage. Thus, efforts to implement inclusive education within public policy frameworks encounter major challenges, producing barriers that hinder tangible progress in learning outcomes and, consequently, quality of life for students with disabilities. As Brown [13] noted, the medical-psychological model still dominates special-education practices in many Arab countries, particularly regarding sensory disabilities.

Accordingly, the issue of higher education for DHH students is of critical importance. Numerous studies have demonstrated that these students face various administrative, academic, and social difficulties in higher-education institutions—mainly due to limited linguistic competence, particularly in reading, writing, and communication [1, 14-16]. Within higher-education programs, DHH students encounter obstacles during lectures and seminars that impede communication, comprehension, and learning [17]. A key barrier is restricted access to information in environments dominated by spoken language [17, 18].

To mitigate such barriers, it is essential to create positive learning experiences for DHH students by ensuring access to support services, assistive technologies, effective communication channels, and opportunities for social interaction. Educational readiness is a major predictor of their success in higher education [15]. Providing adequate facilities and services for DHH students helps remove barriers and positively impacts their academic performance and likelihood of completing university studies [19]. Support services may include sign-language interpretation, captioning, speech-to-text transcription, note-taking, and tutorial assistance [19, 20]. The scope of services varies depending on individual performance levels and educational contexts [21] as well as the number of DHH students in a given classroom [22]. At the Arab level, Al-Wabili [23] conducted a study examining the nature of facilities, support services, and special programs that

higher-education institutions should provide for students with disabilities from the perspectives of special-education faculty in Saudi, Jordanian, and Emirati universities. The findings emphasized the importance of providing physical, financial, and administrative accommodations, flexible admissions and testing procedures, and specialized equipment.

Based on the foregoing, it has become essential to identify the key requirements and services necessary to ensure the academic success of DHH students in higher-education institutions.

2. Problem Statement

Numerous studies have investigated higher-education programs for DHH students worldwide [23-26]. and within the Arab world [1, 16, 27-29] found that despite expanded educational opportunities, the academic achievement of DHH students remains lower than that of their hearing peers, calling for administrators to revisit institutional policies and strategies to address these challenges.

Tracing the development of higher-education programs may thus help increase DHH students' participation and improve program design to enhance their success and quality of life [30]. Offering higher-education programs without meeting essential needs and requirements can lead to failure or withdrawal Al-Ruwaite [20]. [31] also highlighted the scarcity of studies focusing on the core lived experiences of individuals in higher education. The lack of theoretical and evaluative frameworks for such experiences leaves gaps in understanding their long-term effects on students' lives. Accordingly, this study draws upon teachers' real-world perceptions of DHH students to propose community-driven solutions that address educational and employment gaps within the DHH community.

The need for this study stems from the researcher's belief that many DHH students possess the motivation, ambition, and competence to succeed in higher education. Despite the historical challenges of integrating DHH learners into educational systems, recent developments in special-education services have enabled many to complete secondary schooling. Yet, the critical question remains: What comes after high school? [32]. Thus, the present study seeks to explore the essential requirements that facilitate DHH students' admission and success in higher-education institutions.

3. Research Questions

1. What are the requirements for enrolling DHH students in higher-education institutions from the teachers' perspective?
2. What are the most important admission requirements for mental health students in higher education institutions?
3. Are there statistically significant differences ($\alpha = 0.05$) in teachers' perspectives based on their educational qualification or years of experience?
4. What proposed framework could enhance the provision of these requirements in higher-education institutions?

4. Significance of the Study

The significance of this study lies in the critical and timely nature of its subject, which addresses the inclusion of DHH students in higher-education institutions—a field that remains underexplored in the Arab context. The study holds both theoretical and practical importance.

From a theoretical perspective, the findings are expected to help identify the essential requirements that should be in place when admitting DHH students to higher-education institutions, arranged according to their relative priority and significance. Moreover, the study enriches the Arabic academic literature with comprehensive data on the necessary conditions and educational provisions for DHH students in higher education, thereby filling an important gap in local and regional research.

From a practical perspective, the results of this research can guide policymakers and university administrators in considering these requirements during the planning, development, and implementation of programs designed for DHH students. By integrating such considerations into institutional policies and practices, universities can enhance the quality of services provided to this group. Furthermore, higher-education institutions intending to admit DHH students can benefit directly from the findings of this study to ensure their academic achievement, social integration, and overall success within the university environment. Also, the study draws on direct insights from professionals who interact closely with DHH learners, integrating their perspectives into a proposed model to improve educational and career opportunities.

5. Literature Review

The issue of higher education for DHH students is one of the most critical topics in the field of education. It requires substantial preparation and specific provisions to ensure success.

Numerous studies have emphasized the need for dedicated financial allocations to meet the diverse needs of this population in higher-education institutions. Most legislation in developed countries guarantees students with disabilities the right to free access to both public and private university education. However, the principal challenges lie in providing special educational services, supportive services, architectural accessibility, assistive technologies, and qualified personnel, as well as appropriate curricula, tutoring centers, and remediation programs—all of which require significant financial investment to address the individualized needs of university-qualified students with disabilities [33]. Consequently, the cost of higher education per student is relatively high, underscoring the necessity of ensuring adequate funding [34]. Moreover, institutions must secure additional financial compensation for trainers and professionals who continuously work with DHH students in higher-education settings [35].

Another crucial requirement concerns flexibility in the admissions process. Students with disabilities often face multiple challenges during admission because most offices apply the same procedures and criteria used for hearing students. Therefore, universities should adopt more flexible admission policies, especially when entrance examinations determine eligibility. This does not mean lowering institutional standards; rather, it entails allowing DHH applicants the opportunity to demonstrate competence. Al-Rais [33] emphasized the importance of establishing a specialized admissions and registration office staffed by professionals fluent in sign language. Similarly, Al-Kurdi and Oudah [32] stressed the need to train faculty members in sign-language skills and to assign interpreting specialists across departments. Furthermore, institutions should develop inclusive-education strategies and build awareness among academic and administrative staff regarding the inclusion of DHH students while assessing their own readiness to accommodate this population Shareetah [34]. Al- Shamsan[36] highlighted the responsibilities of supervisors of higher-education programs for DHH students, which include coordination between the special-education department and university colleges, conducting interviews with newly admitted deaf students, identifying staffing and material needs, and monitoring the performance of resource-room teachers and sign-language interpreters. Both Al-Munae and Al-Rais [35] and Sheryl, et al. [37] emphasized the necessity of conducting professional-development workshops for instructors and staff working with DHH learners. Moreover, they recommended that institutions explicitly consider DHH trainees when formulating regulations and policies and prepare a mission and vision statement addressing the training of DHH students.

Creating an accessible learning environment is another prerequisite before admitting DHH students into higher-education institutions. This includes equipping classrooms and laboratories with modern technologies and ensuring that lecture halls contain necessary assistive devices Al-Khuraiji and Al-Rais [16]. Al-Kurdi and Oudah [32] further stressed that classrooms must be suitable in size and layout, allowing DHH students to sit in front rows for lip-reading and maintaining visual access to the lecturer's face. Campuses should include signage systems designed for DHH students, and laboratories should contain visual indicators. University libraries should employ sign-language-fluent staff to assist DHH students in borrowing and returning materials. Al-Rais[33] also underscored the role of university disability-support centers in providing academic advising, accessible facilities, and assistive technologies, such as visual alarm systems, captioning screens, and personal and group hearing-assistive devices.

With regard to academic programming, attention should be given to the educational process itself-specifically, expanding access to fields aligned with labor-market needs rather than limiting DHH students to narrow areas of study. Several researchers have recommended establishing a preparatory (foundation) year to enhance students' linguistic and cognitive skills and prepare them for postsecondary education [16, 32, 35, 38] suggested a number of disciplines suitable for DHH students, including special education, mathematics, accounting, cosmetology, and food industries, stressing the need to adapt curricula to their characteristics. Al- Shamsan [36] added that art education and textiles and clothing are also appropriate majors. Multiple studies have underscored the importance of preparatory programs in strengthening reading, writing, and mathematics skills, noting that language weakness is one of the primary barriers to DHH students' success in higher education [16, 27, 33, 38]. Regarding assessment methods, Sheryl, et al. [37] reported that visual cues and video-based assessments are more suitable than written exams for DHH students. Al-Ghoul [39] recommended granting extended testing time and providing lecture transcripts. Likewise, Al- Shamsan [36] and Akhdar [40] emphasized offering lecture notes in advance, employing varied teaching methods, conducting continuous assessment, and encouraging DHH students' participation in curricular and extracurricular activities, along with remedial programs in reading and language expression.

Accordingly, higher-education institutions must provide instruction for DHH students through the most appropriate languages and communication modes. Article 24 (4) of the UN Convention on the Rights of Persons with Disabilities explicitly states that sign-language learning should be facilitated and that education for DHH students must be offered in the language and communication mode most suitable to them, in environments that maximize academic and social development [10]. Since sign language is the preferred communication method among most deaf individuals [41] there is a strong need for qualified sign-language interpreters who can serve as a bridge between deaf and hearing individuals in higher education. The U.S. Education for All Handicapped Children Act (Public Law 94-142, 1975) mandates the provision of sign-language interpreters to ensure DHH students' access to classroom information Masoud [42]. Al- Shamsan [36] described several personal attributes required of faculty members working with DHH students, such as responsibility, receptiveness to feedback, professionalism, and positive relationships with colleagues. The duties of sign-language interpreters include translating both theoretical and practical lectures, maintaining punctuality, assisting faculty with interpretation tasks, positioning themselves face-to-face with DHH students, and preparing in advance by reviewing lecture materials. Therefore, a key prerequisite for the success of higher-education programs for DHH students is to train interpreters in academic and scientific translation and to prepare faculty members who will teach DHH students to use inclusive instructional strategies [43].

6. Materials and Methods

6.1. Methodology

The present study employed the descriptive survey method, as it is the most appropriate approach for collecting data related to the phenomenon under investigation. This methodology allows the researcher to obtain an accurate description of the topic and to utilize a quantitative instrument for data collection [44].

6.2. Population and Sample

The study targeted female teachers specialized in hearing impairment who teach across all educational levels in public and/or private schools in Al-Ahsa Governorate, Saudi Arabia. The total population comprised 76 teachers. A census

sampling technique was adopted. After obtaining official approval to conduct the study, the researcher distributed printed questionnaires manually to all teachers of DHH female students in Al-Ahsa. Out of the total population, 61 teachers met the inclusion criteria and completed the questionnaire. The inclusion criteria were: (a) Teachers currently working with DHH students at any educational stage. (b) Employment in either public or private schools. (c) Active service at the time of data collection. (d) Consent to participate in the study.

Table 1.
presents the demographic characteristics of the study sample.

Category	Subcategory	N	%
Educational Qualification	Bachelor's degree	54	89%
	Postgraduate studies	5	8%
	Other	2	3%
Years of Experience	Less than one year to one year	4	7%
	Two to five years	44	72%
	More than five years	13	21%

6.3. Instrument (Researcher-Developed)

After reviewing the literature on similar studies and appropriate theoretical frameworks (e.g., [16, 32, 33, 36]), a questionnaire was constructed. The first section comprised two items to collect participants' demographic information. The second section was designed to gather data on the key requirements for enrolling DHH students in higher-education institutions, aligned with the study objectives. This section consisted of 35 statements covering six principal domains: Financial, Administrative, Educational Environment, Educational Process, Faculty Member, and Sign-Language Interpreter. Participants rated each item on a five-point Likert scale: Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree = 5. The items were distributed across domains as follows:

- Financial requirements (Items 1–5)
- Administrative requirements (Items 6–12)
- Educational-environment requirements (Items 13–18)
- Educational-process requirements (Items 19–23)
- Faculty-member requirements (Items 24–30)
- Sign-language-interpreter requirements (Items 31–35)

To ensure the instrument's suitability and validity for the study purposes, several procedures were undertaken. First, six experts in special education and/or psychology reviewed the questionnaire items. Based on their feedback, revisions were made, including modifications to four items. Next, internal consistency was examined via a pilot test (n = 20) of teachers. Pearson product–moment correlations for items ranged from 0.416 to 0.883; all item–domain total correlations were statistically significant at $p < .01$, indicating satisfactory internal-consistency validity.

Cronbach's alpha coefficients assessing reliability ranged between 0.66 and 0.89, with an overall scale reliability of 0.94, reflecting high internal consistency. Finally, split-half reliability was assessed, yielding a correlation of 0.89, which also indicates good reliability. Collectively, these indicators support the instrument's adequacy for achieving the study's aims.

6.4. Data Analysis

After screening 64 returned questionnaires, 3 were excluded due to incomplete data, resulting in a final analytic sample of 61 responses. Data were analyzed using IBM SPSS Statistics (Version 19) to obtain: (a) frequencies and percentages for describing participants' responses; (b) means and standard deviations to rank responses across items; and (c) the Kruskal–Walli's test to examine differences in responses according to the study variables.

7. Results

7.1. Results of the First Question

To identify the required provisions for enrolling DHH students in higher-education institutions, means and standard deviations were computed for participants' responses to the second section of the questionnaire. These results are presented in Table 2.

Table 2.
Means and standard deviations of teachers' responses regarding the requirements for enrolling DHH students in higher-education institutions.

No.	Statement	Mean	SD
1	Allocation of budgets to provide auditory aids required by DHH students.	4.590	0.692
2	Providing financial incentives to support DHH students in universities.	4.771	0.462
3	Allocating budgets to provide visual-based educational tools required by DHH students.	4.803	0.542
4	Availability of financial support for using suitable technological and computer devices for DHH students.	4.721	0.552
5	Providing additional financial allowances for trainers and staff working continuously with DHH students.	4.574	0.590
6	Raising awareness among university staff and students about the nature of DHH students.	4.787	0.413
7	Establishing evaluation criteria for faculty members teaching DHH students.	4.574	0.644
8	University administration provides support services for DHH students.	4.672	0.598
9	Conducting training courses for faculty to enhance communication skills with DHH students.	4.771	0.643
10	Allocating a specific admission quota for DHH students in higher-education institutions.	4.721	0.488
11	Availability of a dedicated admissions and registration unit staffed with sign-language specialists.	4.738	0.575
12	Availability of a specialized academic advising unit for DHH students.	4.721	0.686
13	Appropriate number of DHH students in classrooms.	4.623	0.637
14	Designating seating areas for DHH students in the front rows.	4.754	0.567
15	Providing captioning screens that display everything spoken by the instructor.	4.754	0.471
16	Providing visual signaling systems that convert sound into light.	4.771	0.496
17	Equipping classrooms with collective hearing aids (FM systems).	4.771	0.529
18	Providing resource rooms suitable for teaching DHH students.	4.754	0.567
19	Offering academic majors suitable to the labor-market needs for DHH students.	4.803	0.477
20	Preparing DHH students through a preparatory year to strengthen reading and writing skills.	4.836	0.373
21	Using modern technology in teaching DHH students at universities.	4.820	0.428
22	Considering the characteristics of DHH students when designing exams.	4.836	0.454
23	Adapting curricula to match the characteristics of DHH students.	4.803	0.401
24	Faculty readiness to deal with the characteristics and needs of DHH students.	4.705	0.527
25	Faculty awareness of sign-language interpreters by avoiding excessive speaking speed.	4.771	0.424
26	Faculty use of appropriate instructional strategies for teaching DHH students.	4.836	0.373
27	Faculty familiarity with research and educational publications on teaching DHH students.	4.623	0.582
28	Faculty members' initiative and creativity in working with DHH students.	4.689	0.467
29	Faculty proficiency in communication methods suitable for DHH students.	4.754	0.434
30	Faculty experience with the nature of DHH students.	4.689	0.501
31	Availability of a competent sign-language interpreter to convey information to DHH students.	4.853	0.358
32	Sign-language interpreter possesses specialized qualifications enabling translation for DHH students.	4.639	0.606
33	Sign-language interpreter is familiar with the course content provided to DHH students.	4.672	0.651
34	Availability of a skilled sign-language interpreter to facilitate understanding for DHH students.	4.771	0.529
35	Translating all interactions and comments occurring in class for DHH students.	4.656	0.629

Table 2 showed that the highest level of agreement was recorded for Item 31, which concerned the availability of a qualified sign-language interpreter capable of effectively conveying information to DHH students. Most participants strongly agreed with this statement (M = 4.485). In contrast, Item 5—providing additional financial compensation for trainers and staff who work continuously with DHH students—and Item 7—establishing evaluation criteria for faculty members teaching DHH students—received the lowest ratings (M = 4.573). This indicates that participants placed comparatively less emphasis on evaluating or incentivizing faculty members than on other institutional requirements.

7.2. Results of the Second Question

To answer this question, means and standard deviations were computed for all six questionnaire domains. The results are presented in Table 3.

Table 3.
Means and standard deviations, ranked in descending order according to teachers' responses across questionnaire domains.

No.	Domain	Mean	SD	Rank
4	Requirements related to the educational process	4.8000	0.36515	1st
3	Requirements related to the educational environment	4.7377	0.35284	2nd
5	Requirements related to the faculty member	4.7237	0.37604	3rd
6	Requirements related to the sign-language interpreter	4.7180	0.44178	4th
2	Administrative requirements	4.7119	0.43291	4th
1	Financial requirements	4.6918	0.37162	5th
	Overall Mean	4.7293	0.32091	

As shown in Table 3, the overall mean across questionnaire domains was 4.72, corresponding to the *Strongly Agree* range. This indicates that participants expressed strong agreement with most statements, confirming the importance of all domains included in the survey. However, slight variation was observed in the level of agreement:

- The educational-process domain ranked first (M = 4.80).
- The educational environmental domain ranked second (M = 4.73).
- The faculty-member domain ranked third (M = 4.72).
- The sign-language-interpreter and administrative domains jointly ranked fourth (M = 4.71).
- The financial domain ranked last (M = 4.69).

7.3. Results of the Third Question

7.3.1. Differences by Educational Qualification

To determine whether teachers' perspectives differed by educational qualification, the Kruskal–Walli's test was applied. The results are presented in Table 4.

Table 4.
Kruskal–Walli's test results for differences in teachers' views according to educational qualification.

Group	N	Mean Rank	Significance Level
Bachelor's degree	54	31.06	0.845
Postgraduate degree	5	28.10	
Other	2	36.50	

As shown in Table 4, the significance level was p = 0.845, indicating no statistically significant differences among teachers' views regarding the requirements for enrolling DHH students in higher-education institutions attributable to educational qualification.

7.3.2. Differences by Years of Experience

To examine whether perspectives varied by years of experience, the Kruskal–Wallis test was again applied. The results are summarized in Table 5.

Table 5.
Kruskal–Walli's test results for differences in teachers' views according to years of experience.

Group	N	Mean Rank	Significance Level
Less than one year to one year	4	32.88	0.620
Two to five years	44	29.67	
More than five years	13	34.92	

As indicated in Table 5, the significance level was p = 0.620, demonstrating that there were no statistically significant differences in teachers' views regarding the requirements for enrolling DHH students in higher-education institutions based on years of experience.

7.4. Results of the Fourth Question

Based on the results derived from questionnaire analysis, a series of recommendations were developed to enhance the provision of requirements for enrolling DHH students in higher-education institutions. The proposed framework includes recommendations not only for improving these provisions but also for ensuring that DHH students can easily access them whenever needed. Achieving this comprehensive vision requires coordinated action at multiple levels within Saudi society and government while safeguarding the rights and privacy of individuals with disabilities.

The analysis revealed strong consensus among specialists regarding the necessity of providing a range of supports and services for DHH students in higher-education institutions. Furthermore, there is broad recognition of the need for structural reforms within all Saudi higher-education programs—both public and private. The relevant stakeholders include: (a) Teachers, administrators, and staff in all schools and institutes serving DHH students; (b) Ministry of Education officials; (c) University administrators and decision-makers; and (d) DHH students themselves. The key components of the proposed framework are illustrated in Figure 1.

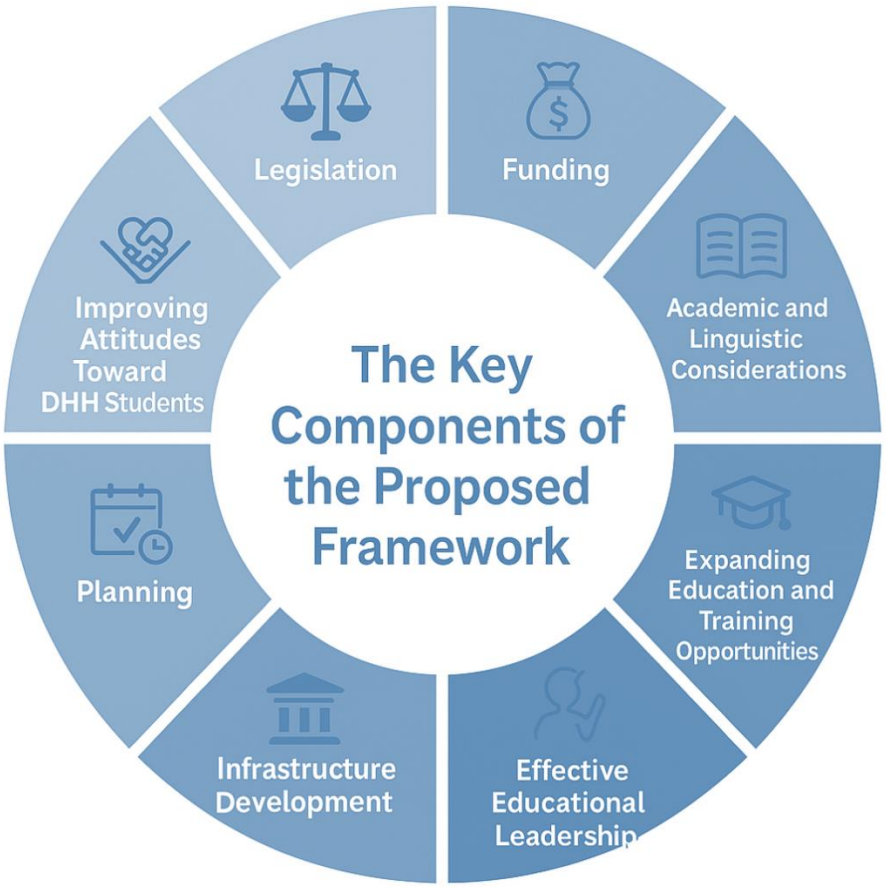

Figure 1.
The key components of the proposed framework.

A detailed illustration of these components is provided below:

1. Legislation: Strengthen the linkage between existing laws and the institutions responsible for implementation, including mandating—not merely recommending—that some universities admit qualified DHH students (both male and female) under reasonable conditions and with appropriate services. This will bridge the gap between government directives and actual institutional practices, ensuring equitable access and successful outcomes.
2. Funding: Adequate funding is essential to develop facilities, acquire equipment, implement assistive technologies, and recruit and train staff. Funding should cover both mainstream and special-education programs.
3. Academic and Linguistic Considerations: Address the language deficits commonly observed among DHH students prior to university admission by establishing a preparatory year tailored to their linguistic and cognitive needs, along with targeted language-support courses.
4. Expanding Education and Training Opportunities: Enhance teacher-training curricula and increase opportunities for in-service professional development.
5. Planning: Prioritize strategic planning and development to ensure that the necessary requirements are in place before student admission.
6. Effective Educational Leadership: Positive administrative support is vital to maintain staff morale, ensure adequate resources, and provide relevant professional-development opportunities. Leadership should demonstrate flexibility and innovation to adapt to evolving educational systems.
7. Infrastructure Development: Equip classrooms with modern assistive technologies and establish disability-support offices within universities to deliver essential services.
8. Improving Attitudes Toward DHH Students: One of the most crucial success factors for DHH students is the preparedness of their peers to engage and collaborate effectively. Universities should actively foster inclusive attitudes and awareness campaigns among the broader student community.

Achieving this comprehensive vision requires coordinated action at multiple levels within Saudi society while safeguarding the rights and privacy of DHH individuals. Implementing this proposal requires collaboration among all stakeholders—government bodies, universities, administrators, teachers, specialists, students, and families. To ensure effective implementation, the roles and responsibilities of each group must be clearly defined, and all parties should be actively consulted regarding their goals, needs, and expectations.

A representative committee from each stakeholder group could jointly draft a written implementation plan through open discussions. Public consultation and feedback should be encouraged and incorporated. Once finalized, a written document should outline the plan and specify procedures for future revisions as needed.

Periodic evaluation of the effectiveness and appropriateness of these requirements is essential, to be conducted by a designated internal or external body. This process ensures sustainability and ongoing improvement. Administrative monitoring should accompany these evaluations, and such criteria should be included in assessments of both institutional and faculty performance, with student achievement serving as a key metric.

Through these measures, the following outcomes are anticipated:

1. Enhanced effectiveness and accessibility of requirements for DHH students in higher-education institutions.
2. Stronger collaboration between organizations and agencies serving the DHH community.
3. Reduction of existing challenges and barriers hindering DHH students' academic success in higher-education institutions.

8. Discussion

The findings of the present study indicate that the most essential requirements for enrolling DHH students in higher-education institutions are those related to the educational process, which ranked first in importance. This result aligns with several empirical studies [27, 35]. Prior research has shown that academic challenges represent a major obstacle in educating this population [36, 45] underscoring the need to offer appropriate majors that align with labor-market demands and enable graduates to obtain jobs suited to their characteristics and strengths [32, 38]. The importance of academic skills during the transition to university and the need for learning environments that address linguistic gaps have also been emphasized [46].

In addition, prior studies have highlighted the necessity of adapting examinations and assessment methods and granting extended time for DHH students in higher education [27, 37, 39]. They further called for curricula that are suited to DHH learners' capacities, noting that the use of general, non-specialized curricula is a major barrier to success [34, 35]. Several studies concurred on the value of a preparatory year to build DHH students' linguistic and academic readiness [27, 33, 35, 36, 38]. Conversely, this finding differs from Al-Khuraiji and Al-Rais [16] who ranked educational obstacles sixth, reflecting divergent participant viewpoints across studies.

Requirements related to the educational environment ranked second, consistent with numerous studies stressing the need to provide suitable campus environments for DHH students [32, 35, 40, 45] reported that the main barriers faced by students with disabilities at King Abdulaziz University include mobility difficulties across campus buildings and insufficient equipment. Al-Khashrami [47] underscored the importance of establishing service centers within universities, while Hanafi [1] recommended an implementation guide to regulate the educational environment in higher education and training programs for DHH students before and during enrollment. The significance of support services—such as note-taking, specialized centers, and trained supervisors—has been repeatedly documented [27, 33, 47]. Additional necessities include presentation screens, lip-reading supports, captioning displays [33] resource rooms for theoretical subjects [36] and assistive listening systems such as FM systems [33, 35, 40]. This result, however, contrasts with Al-Khuraiji and Al-Rais [16] who identified the educational environment as the primary barrier from faculty members' perspectives.

Requirements pertaining to the faculty member ranked third, in agreement with studies that emphasize specific professional competencies for those teaching DHH students in higher education [37, 48, 49] stressed proficiency in sign language; Powell [15] recommended one-to-one sessions to clarify course requirements and assessment methods; and Al-Rais [33] highlighted the need to prepare instructors to use modern educational technologies and adapt teaching strategies. Al-Ghoul [39] noted that some DHH students struggle because certain faculty members are insufficiently attentive to their presence in class. Thus, there is a pressing need for specialized professional preparation for faculty that addresses DHH learner characteristics [48]. Administrative bodies should define clear criteria and incentives for faculty teaching DHH students [32, 42] as low morale among instructors can undermine program success [35]. This result diverges from Al-Khuraiji and Al-Rais [16] who placed faculty-related obstacles fourth.

Requirements related to sign-language interpreters and administrative needs jointly ranked fourth. This aligns with research affirming the necessity of qualified interpreters in higher education [35, 37, 42]. Interpreters are a cornerstone of DHH students' academic experience, serving as the critical bridge between DHH learners and the hearing community and thereby supporting academic and social integration [35, 42, 50]. To perform this role effectively, interpreters must possess analytical abilities, precise listening, and mastery of both spoken and signed languages [51] while also considering DHH cultural backgrounds and avoiding literal translation [52]. Others have emphasized cultural competence regarding Deaf communities to meet needs more effectively Cooper, et al. [53] and Harris, et al. [54]. Al- Shamsan [36] recommended interpreters stand facing students and prepare materials in advance, whereas [35] advised coordination meetings between interpreters and faculty at the start of each semester. Since the 1950s, scholarship has cataloged key interpreter attributes, largely focusing on linguistic, cognitive, and communicative skills [55] though personal qualities such as adaptability, teamwork, confidence, perseverance, and collegiality have received less attention Hiltunen, et al. [56]. Al-Bash, et al. [57] recommended strengthening faculty–interpreter collaboration, while other studies cautioned that insufficient interpreter proficiency in conveying concepts can impede instructional quality [16, 35].

Regarding administrative needs, the current result accords with several studies emphasizing the importance of administrative supports in university instruction for DHH students [32, 33]. Administrations should provide awareness seminars to familiarize faculty with DHH student characteristics and effective communication strategies Sheryl, et al. [37] and Akhdar [40]. Al-Munae and Al-Rais [35] found that major barriers at the Colleges of Telecommunications and Information (Riyadh and Hail) included insufficient specialized training in sign language and deaf education and the absence of dedicated support centers. By contrast, the present result differs from Al-Khuraiji and Al-Rais [16] who ranked interpreting barriers seventh and administrative barriers second, and from Al- Shamsan [36] who also ranked administrative

barriers second. The present divergence is attributed to differences in sample characteristics and institutional contexts across studies.

Financial needs ranked fifth and last, consistent with Al- Shamsan [36] who found that economic challenges faced by DHH students at the College of Home Economics and Art Education in Princess Nourah bint Abdulrahman University in Riyadh were relatively less prominent. This also aligns with Shareetah [34] who reported that a key financial obstacle for an integration and support program for hard-of-hearing students at the Al-Bayan Institution (Lebanon) was the high per-student cost. Al-Rais [33] noted that university education for students with disabilities entails substantial expenses, necessitating targeted financial incentives. Akhdar [40] emphasized the importance of faculty incentives, a point echoed by Al-Munae and Al-Rais [35] who observed that the lack of additional compensation for trainers working with DHH students was a major problem. Conversely, this result differs from Al-Khuraiji and Al-Rais [16] who ranked economic issues third among higher-education challenges for DHH students.

The researcher attributes the last-place ranking of financial needs to the idea that financial issues are less critical than those requiring organization, training, and careful selection; budgets can often be secured relatively quickly—especially given the substantial allocations Saudi Arabia provides to higher education and special education. Nonetheless, budget shortfalls clearly affect environmental readiness, the educational process, and the availability of qualified personnel, confirming the interdependence of these domains.

Overall, the results of the current study are broadly consistent with Abdulrahman [58] which identified financial and administrative barriers as the most prominent obstacles to higher education for DHH students, in addition to barriers related to the educational environment, instructional process, faculty, interpreters, and the students themselves. It recommended pre-university preparation through foundation programs, training courses, or a preparatory year; faculty qualification in sign language; infrastructure and technological supports; support services; and dedicated support offices. The results also accord with Al-Bouzaid, et al. [30] which documented challenges in higher-education programs for DHH students, including administrative and social issues and a shortage of interpreters, and called for developing professional competencies, documenting academic signs, and establishing databases to track program activities. Additionally, Garberoglio, et al. [59] identified eight core strategies to improve postsecondary outcomes for DHH individuals: engaging in systems-change strategies, improving partnerships and resource sharing, strengthening transition planning, building support communities for DHH youth, fostering youth skills, supporting families, improving access to programs and services, and providing professional development—all of which require system-wide commitment, including from the broader community.

Finally, the study found no statistically significant differences in identifying requirements by academic qualification or years of experience. The researcher attributes this to similar educational backgrounds among participants—most held bachelor's degrees or had recently graduated, leading to comparable experiences. For years of experience, senior teachers may understand needs through practice, while newer teachers may be more attuned to current trends, yielding convergent views; teachers' ideas may also converge when working within the same settings. These results differ from Al-Khuraiji and Al-Rais [16] who reported differences by educational qualification (favoring those with doctorates) and by shorter experience (less than one year). The researcher explains the discrepancy by noting that the Al-Khuraiji and Al-Rais [16] study focused on obstacles, whereas the present study examined requirements; higher academic levels may heighten awareness of obstacles, while recognizing requirements is possible for any specialist who works with DHH learners. Greater experience can sharpen critical perspectives on obstacles, whereas requirements can be understood conceptually without extensive practical experience.

9. Conclusion

The present study concludes that enrolling DHH students in higher-education institutions is a complex undertaking. Nevertheless, it is a shared responsibility among all stakeholders identified herein to optimally serve this population. The proposed scenario articulated in this study may enhance the effectiveness of the identified requirements and lay the groundwork for a conceptual and implementation framework that, in turn, improves overall quality of life and academic success for DHH students in higher education.

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