

Article

Inclusion and Deaf and Hard of Hearing Students: Finding Asylum in the LRE

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Abstract: The movement towards inclusive public education for deaf and hard of hearing children (DHH) has steadily gathered momentum during the last fifty years. Both within the United States and abroad, inclusive public education has been facilitated through legislative action with varied results. Varied interpretation of inclusion policy, notably the “Least Restrictive Environment” (LRE) clause of the Individuals with Disabilities Education Act in the United States, an emphasis on assimilation, and a default preference for auditory-oral communication have often resulted in isolating and inaccessible experiences for DHH students in the mainstream. The purpose of this article is to review theory and research on effective practices in inclusion for DHH students. The research is summarized with respect to accessibility, social-emotional considerations, and language policy. It is often asserted that communication access and cultural identity are major factors that impact the successful inclusion of these students with bicultural identity related to greater wellbeing. Deaf schools may be the LRE placement option for some students and source of resource and support for DHH students and educators in all settings. The authors suggest that a shift towards a more inclusive experience in mainstream settings is emerging through the use of Universal Design for Learning (UDL), classroom technology, and culturally responsive education that integrates sign language and Deaf culture to foster bicultural identities. Strategies for effective inclusion include co-enrollment, deaf awareness programming, and consistent policy that equalizes the status of sign languages. Future research is recommended in effective practices in auditory and visual accommodations, integration of technology in K-12 classrooms, and the relation of policy to practice in inclusive education for DHH students.

Keywords: inclusion; deaf; hard of hearing; deaf education; universal design for learning; UDL; accessibility; culturally responsive education



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1. Introduction

While formal deaf education began hundreds of years ago in specialized schools that educated deaf people together using sign language [1], a movement toward inclusive public school education during the past 50 years has resulted in the majority of deaf and hard of hearing students currently educated in classrooms with hearing students that use spoken language [2]. The experiences of deaf and hard of hearing students in these classrooms can be either inclusive or restrictive depending on the degree of accessibility and social integration. As we move forward through the trend of mainstreaming, we must ask how the inclusion of deaf and hard of hearing children has been realized in practice and what evidence exists for its success? More specifically, how have issues of language and communication, social development and academic achievement been addressed? This paper will review the historical and legal context of inclusion; explore accessibility, social-emotional, and political factors in achieving inclusion; and outline strategies for implementing Universal Design for Learning (UDL) and culturally responsive education.

The deaf and hard-of-hearing population is diverse. Wide variations are found in the cause of deafness, level of hearing, age at onset, communication methods, and cultural

identity. The term Deaf (capitalized) refers to a community of people who share a language (ASL) and hold a set of beliefs about themselves and their connection to greater society [3]. As aspects of this paper address a range of cultural and audiological notions related to cognitive and language development, deaf and hard of hearing (DHH) will be used to refer to the general population, while Deaf will be used to refer to the cultural identification of the ASL community.

2. Brief History of Deaf Education

Organized deaf education in Europe and the United States began with special schools serving deaf and hard of hearing children. In the United States, the Connecticut Asylum for the Education and Instruction of Deaf and Dumb Persons, later renamed the American School for the Deaf, was established in 1817 in Hartford, Connecticut [1]. Although the term *asylum* may commonly have negative connotations and has thus been removed from many program titles as a symbol of the deinstitutionalization movement [4], the word was used in the early 19th century to indicate that the institution would be a protective and supportive setting. The use of this term asylum in the context of deaf education indicates that the special schools were providing educational care and protection that were not otherwise available to DHH children.

Through the next 150 years, deaf schools, usually residential, most following a sign language pedagogy and others an auditory-oral language pedagogy were established across the country producing a wealth of deaf (and hearing) scholars, educators and administrators. These schools laid a foundation for Deaf culture, Deaf studies, and organizational activism among Deaf people [1,5]. Deaf schools offered DHH children the opportunity to learn with each other, to have access deaf role models and exposure to an emerging cultural identity. Throughout this time, public education was mostly inaccessible to most DHH students, and a rising number began attending schools alongside hearing peers [1,6]. Although little is known about the experience of DHH students in mainstream classrooms in the 19th century, a wealth of information exists that highlights their school experience in the 20th century, with mixed results that were frequently isolating with varying levels of access and achievement [7].

While many early schools for the deaf used sign language to communicate, proponents of oral education advocated against the use of sign language (and deaf teachers) in deaf education. At an International Congress on the Education of Deaf in 1880, a resolution was passed to prohibit sign language in schools for the deaf. This resolution is widely recognized as a catalyst for a movement toward auditory-oral education and the exclusion of sign language and deaf teachers [8]. Aligned with the modernist values of the time, auditory-oral education followed the rise of nationalism, and the 20th century began a tumultuous century in language planning. Public school laws, eugenics campaigns, grassroots resistance, disability activism, and medical treatments shaped deaf education into a controversial field rife with bias, resistance, technological advances, and a sociolinguistic dichotomy [1,6].

In 1964, the United States government appointed an advisory committee to investigate the status of deaf education and teacher preparation. Their report [9] raised concern that few deaf children were successfully prepared for full participation in society. The committee challenged the exclusive use of auditory-oral education while also outlining a preference for instructing deaf children with spoken language and then subsequently adding sign language if the student failed to achieve using oral methods alone. Emphasizing the achievement potential of deaf students, the report identified two primary barriers: failure to apply research to practice and failure to develop systematic and ongoing educational programming. Program recommendations include early detection and intervention programs, the availability of multiple clinical resources, parental support, auditory equipment, speech and language intervention services, and specialized educational programs with "... medical, audiological, psychological, social service, and other diagnostic services not routinely associated with education" [9] (p. xviii). Along with emphasizing the importance

of specialized schools (both signing and oral), the committee recommended that deaf students also have the opportunity to attend integrated classes with hearing peers along with the provision of specialized teachers and resources [9].

3. Brief History of Mainstream Special Education

Inclusion, as noted by Paul [10] is not only an educational issue, but may be a political one. Despite the academic and cultural contributions of deaf schools, the notion that separate schooling was a form of segregation is a long-standing issue of public school equity in the United States. After litigation determined that separation or exclusion in public education was inherently unequal, [11,12] legislative action followed. In 1975, the All Handicapped Children Act (P.L. 94–142) was passed, mandating that public schools provide a Free and Appropriate Public Education (FAPE) to students with disabilities, along with an Individualized Education Plan (IEP) [13]; reauthorized into the Individuals with Disabilities Education Act (IDEA) in 1990 [14]. IDEA mandates placing students in the “Least Restrictive Environment” (LRE), described as educating students in the regular classroom to “the maximum extent possible” (20 USC 1412 B § 612 (1) (c)) [13]. In a marked contrast from the use of *asylum* to indicate the protection and support offered in a separate setting, the use of *restrictive* indicated that the more separated or specialized an educational setting, the more limiting and inflexible it was for a student.

For DHH children however, placement in the regular classroom has not automatically resulted in effective interactions or greater achievement. These placements often created isolating experiences for DHH students as they often did not have access to language and communication, other DHH students and deaf adults [7]. In 1986, the Education of the Deaf Act (P.L. 114-95) was passed with the purpose of improving deaf education services and accountability measures, establishing a Commission on Education of the Deaf (CED) that would submit interim reports (20 USC Ch. 55) [15]. Two years later, a report to the President and Congress of the United States by the CED (1988) [16] echoed similar concerns outlined by Babbidge [9], concluding that education of persons who are deaf in the United States was characterized by inappropriate priorities and inadequate resources. Among the issues identified were lack of early identification and intervention, misinterpretation of LRE policy, and inefficient use of technological tools such as captioning and visual media. The report recommended providing guidelines for DHH students, prioritizing English acquisition, and refocusing the LRE concept by emphasizing appropriateness over LRE [16].

The National Association of the Deaf (NAD) position statement on inclusion defines the LRE as the environment with “...the fewest language and communication barriers . . .” [17]. Beyond the United States, a global disability treaty known as the United Nations Convention on the Rights of People with Disabilities (CRPD) includes articles regarding education. In an article on intersectional inclusion that includes analysis of the CRPD, Murray and colleagues define inclusion as a “..learner’s right to participate and reach their potential within public institutions like schools” [18] (p. 697). The authors point out that inclusive education is not defined in the CRPD, but that “mainstream education” is written in as the default placement for students with disabilities, with emphasis on inclusive over segregated environments.

4. Deaf Education and Language Development

The vast majority of DHH children are born to hearing parents who may have little or no knowledge of deaf education and language development. DHH students in previous decades were often not identified within the first several years of life, a concern put forth by the 1965 advisory committee as an urgent priority [9] and reiterated in the 1988 report to Congress as a priority recommendation [16]. In 2000, legislation in the United States was passed requiring universal screening of all infants to identify them at birth and provide immediate services. The Early Hearing Detection and Intervention Act (EDHI) is a Federal law requiring newborn screening and access to intervention services under the Center for Disease Control and Prevention (CDC) (42 U.S.C. 280g-1(f) [19]. Despite the increase in

early identification, there is a lack of consistent intervention and accountability for full access to a first language with equitable emphasis on the role of signed languages [20,21].

In 2011, The Government Accountability Office (GAO) of the United States government published a 31-page letter to Congress with a program evaluation of services and policies for deaf and hard of hearing children, including the Early Hearing Detection and Intervention act (EDHI) and IDEA. The four main findings indicate that (1) a small percentage of the IDEA population is deaf or partially hearing, (2) Deaf children are educated in a variety of ways and most are mainstreamed, (3) early exposure to language, informed parental decisions on communication, individualized education and the participation of skilled professionals is critical for literacy and (4) limited information and resources are challenges to providing interventions. The evaluators also noted a gap in research on effectiveness of early intervention [22]. As the researchers noted, early intervention is crucial for language development and federally funded efforts to facilitate evaluations are important to proving effectiveness so these programs may continue to grow and serve the population [20,21].

Early language exposure has been related to proficiency in language and academic achievement, whether it is signed [23,24] or spoken [25]. Earlier studies showed that deaf students with deaf parents demonstrated greater language abilities and academic performance and that their language milestones were developmentally similar to hearing children [16,24,26], indicating that deaf children were capable of developing language at normal rates with accessible input [20]. More recent studies have verified that DHH students with hearing parents also develop age-expected vocabulary skills when exposed to language (ASL) during infancy [27].

While early exposure to a signed language relates to greater language development [23,24,27], this may be relative to the quality and quantity of the sign language model(s), therefore deaf students who sign may arrive at school with a varying level of language proficiency [20]. Advances in hearing aid/FM technology and cochlear implants have also changed the landscape for the language development and social communication of DHH students, but there is limited information on how assistive technology is integrated into classroom instruction and the impact of auditory devices on long term outcomes relative to previous decades [20,25]. Studies have shown however, that students with a strong foundation in a first language, early age of identification/intervention, greater use of residual hearing, or later onset of hearing loss are more likely to have successful academic and social experiences [21,25].

The most successful placement for DHH students depends on which setting is accessible and appropriate for their language, communication, and social-emotional needs. Schools or districts that are unable to meet the needs of DHH students in the general classroom must either implement specialized programming or consider other placements. This article will outline three inclusion models: full inclusion, regular classroom with services, and cluster programs + co-enrollment. Deaf schools will also be described for their role in inclusive education.

5. Inclusion Models

5.1. Full Inclusion

The full inclusion model of deaf education presents placement of deaf and hard of hearing students in general education classrooms for most or all of the academic day potentially with little to no interaction with other deaf and hard of hearing students and adults [18]. Among the Deaf community, full inclusion is considered to be more of an ideology rather than the intention of IDEA when LRE is interpreted as placement in the neighborhood school without consideration of specific needs for communication, language development and social-emotional needs [17]. Advocates of full inclusion have suggested that separate schools and pull-out programs are a form of segregation [28] and that placement in a general education classroom will enhance social integration for DHH children [29]. Arguments against full inclusion contend that current practices fail to address

or transform the social dynamics and learning needs of students with disabilities [17,30] and generally do not transform the deficiency paradigm of disability [31,32].

Placing children with variable levels of hearing in a classroom with children who hear within normal limits has received mixed reviews and produced diverse results [33–35]. The Solitary Mainstream Project led by Gina Olivia [9] was an early study that collected and analyzed the recollections of 60 DHH adults (aged 25–65) who had spent all or some of their K–12 years in the mainstream apart from other DHH children in the United States and Canada. A qualitative analysis yielded several common themes including feelings of isolation and social exclusion, feeling ‘different’ and ‘not fitting in’ and experiencing the need to excel in sports or academics in order to compensate for their hearing differences. Alternately some participants expressed appreciation for the academic challenge provided in a general education classroom and the opportunity to hone a variety of communication skills [9].

A significant concern about the experience of students in full inclusion settings is the lack of data and monitoring mechanisms to follow the performance and experience of these students [35–38]. The 1988 CED report suggested that less than half of the DHH students educated in mainstream settings experienced any true integration into inclusive classrooms, and that inadequate attention was given to American Sign Language and to considering deaf peers and exposure to deaf adults [16]. Whether these services or settings have improved is difficult to monitor due to limited data on outcomes [39,40]. In addition to sometimes inappropriate or inadequate services, most DHH students—notably hard of hearing students—may not receive any services at all [41]. This is particularly true for rural DHH children [42] and for DHH children during the COVID pandemic [43].

5.2. General Education Classroom with Services

The 1975 EHA stipulates that public schools must provide related services for students with disabilities, defining related services as “...and such developmental, corrective, and other supportive services (including speech pathology and audiology, psychological services, physical and occupational therapy, recreation, and medical and counseling services) as may be required to assist a handicapped child to benefit from special education” 20 U.S.C. § 4 (17). Related services for DHH students may include speech therapy, counseling, special educators, teachers of the deaf, and other consultants. Additional resources may include interpreters, note takers, auditory technology, preferential seating, and other classroom accommodations [44]. These services are provided for through Section 504 of the U.S. Rehabilitation Act of 1973 and are intended to legally ensure that these students in general education classroom are treated fairly. An important note about students who use American Sign Language (in the United States) is that those with a language foundation may benefit from an ASL interpreter while those who are language deprived will require additional support focused on language acquisition (i.e., teachers, language models) to avoid ongoing deprivation [45]. Students who are able to achieve success in mainstream settings using services are generally equipped with a foundational language, able to communicate with members of the school environment, and more likely to have greater residual hearing although their academic experience may be compromised by social and emotional barriers [7,35,46].

For students who have yet to acquire a language and/or cannot communicate with a significant number of people in the school environment, a mainstream setting may not be an appropriate placement to support their individual needs if the school or district cannot provide adequate programming [16,17]. The 1992 policy guidelines released by the US Department of Education clarify the stipulation that any setting which prevents a child from meeting their communication needs “is not the LRE for that individual child” [47] (p. 49275). In these situations, a school or district must either coordinate appropriate programming or consider a more specialized placement such as a cluster program or deaf school.

5.3. Cluster Programs + Co-Enrollment

A cluster site, or regional program, is usually placed in a centrally located school where services for students who are deaf and hard of hearing in that district or participating districts, including both resources and staff, are consolidated. Cluster programs in some settings may include specialized classrooms designed for students requiring a significantly modified curriculum with moderate to intensive support in a separate classroom for some or most of the day. Cluster programs may also include students who spend the majority of the day in the general classroom [48], and/or those who are co-enrolled with other DHH students [49]. Co-enrollment in deaf education refers to classrooms in which a critical mass of DHH students is included in a classroom of hearing students [18]. These programs are sometimes referred to as Integrated Classrooms on IEP and 504 plans. In some settings, a co-enrollment model may also include a team of both deaf and hearing teachers, or regular and special education teachers working together [49,50].

For specialized teachers and service providers who work with DHH students, cluster programs may provide greater opportunities to provide quality related services; both push in and pull out [49]. In terms of social-emotional development Rabsinky and Slobodzian in their qualitative studies did note advantages to clustering, including the idea that children are part of a group of deaf peers and a school climate that may value, promote and celebrate Deaf culture [49,51]. In addition to increased social interactions, co-enrollment models have been related with increased academic achievement and greater awareness and social competency among hearing peers in these integrated classrooms [52]. In one study Kreymeyer and colleagues [53] found that mixed groups of deaf and hearing students working together during academic activities resulted in increased interaction between the two groups during nonacademic activities. Bowen [52] noted that hearing students in a co-enrolled classroom of third and fourth graders had better sign language skills, a more positive attitude toward deafness, and an improved awareness of certain aspects of hearing loss than hearing students in a control classroom.

While the notion of *clustering* as a program placement may be defined in variable ways among regions, a consistent body of research provides support for the benefits of *co-enrollment* models [52–55]. Concerns about cluster programming include difficulties when limited numbers of students result in small, multi-grade classes with a range of ages requiring teachers to meet a wide range of developmental and educational needs. Outside of large urban areas, it may be challenging to have enough DHH students in a single area to form a stable critical mass. Barriers to implementing programs with a critical mass of DHH students include local school finances, administration, student transportation and consensus on instructional approach [48]. For situations with a limited number of DHH students, we suggest that any model of co-enrollment that provides DHH students with access to DHH peers and adults may provide a greater social and academic benefit than solitary inclusion.

5.4. Deaf Schools

While deaf schools are typically interpreted as more restrictive placement that include removal from the home community and limited opportunity to interact with hearing peers [9], they remain a safe place for many DHH students in a continuum of placements. Murray et. al, [18] put forth the idea that “deaf schools and other congregated spaces with deaf students and teachers that support collective identity and cultural development and provide bilingual education can often provide a more inclusive education than mainstream or ‘regular’ classrooms” [18]. For deaf children who use sign language to communicate, a residential or day school for the deaf may be the most appropriate option [9,18,56]. In these environments a deaf child will be amongst other deaf children and adults with greater access to language and communication.

Advantages of deaf schools include specialized teachers, related service providers, administrators, and other faculty and community members knowledgeable and focused on meeting the needs of deaf students. A 2014 study by Shaver and colleagues [2] of

870 DHH secondary school students found that DHH students in deaf high schools were more likely to use sign language and have less residual hearing. Deaf students attending these schools have access to a large group of deaf peers and adults, direct instruction in sign language (at signing schools), and consistent access to language during non-instructional hours [9,18,44,57], although declining enrollment in some deaf schools has reduced their capacity to provide a critical mass of DHH peers [58]. Outside of instructional placement, schools for the deaf also serve as statewide resource centers which school districts can utilize when needed. Deaf schools offer expertise on all aspects of educating DHH children, providing valuable information and referrals, technical assistance, professional development training, curriculum design, and media and materials exchange. Some deaf schools may also offer specialized services to support deaf students in mainstream settings [57], or online courses and programs [59]. Field trips, exchange programs, summer camps, and other creative programs may also provide further enrichment for DHH students in the mainstream.

6. Accessibility Considerations

Variability in hearing level and language ability among DHH students makes it difficult to determine the degree of classroom accessibility in general education classrooms and the conditions of *mandated* accessibility have been an ongoing point of contention. In 1982, the United States Supreme Court ruled on the case of Amy Rowley, a deaf kindergarten student, who was said to experience only 60% of access to classroom information through auditory means. The case was ruled in favor of the family in the District and Appeals Courts and overruled by the Supreme Court, who determined that schools were not required to provide ASL interpreters for students who were considered to be receiving an “adequate education” and not otherwise failing academically (Board of Educ. v. Rowley, 458 U.S. 176 (1982) [60]. The dissenting opinion in the Rowley case suggested that having increased access to auditory information through amplification was not the ceiling of the IDEA, stating that having some benefit is not enough, but that “The Act requires more” [60].

While the provision of ASL interpretation has not been revisited by the US Supreme Court, amendments to IDEA during the 1997, 1999 and 2004 reauthorizations included a greater emphasis on access to the curriculum and required consideration of diverse languages (including sign language) and communication needs, explicitly requiring the IEP team to:

... consider the child’s language and communication needs, opportunities for direct communication with peers and professional personnel in the child’s language and communication mode, academic level, and full range of needs, including opportunities for direct instruction in the child’s language and communication mode. IDEA, Part B, Section 614(d)(3)(B)(iv) [61]

Making a classroom environment accessible for deaf and hard of hearing students may be a challenge for teachers, both because they typically have little to no training in deaf education and because DHH students are so diverse in sensory and cultural experiences. Integrating Universal Design for Learning (UDL) [62] and translanguaging strategies into classroom design can create more accessible environments.

6.1. Universal Design for Learning

Universal Design for Learning (UDL) [62] has emerged as an approach to organizing classroom instruction and culturally responsive education in a way that is accessible to DHH students and conducive to their language learning and information processing. UDL includes presenting information in a variety of ways, allowing students to express their understanding in a variety of ways, and providing a range of opportunities to engage with the content. The goal of UDL is to remove barriers in curriculum and develop barrier-free curricula that is accessible to all and beneficial to all [62]. In an article on including students who are deaf and hard of hearing into the classroom, Allman and colleagues [44] present strategies for inclusion that align with the principles of UDL such as teaching vocabulary

in multiple formats and using visual options to teach auditory information. Implementing these strategies requires teachers to consider optimizing the physical environment for greater auditory and visual access [44]. Whether a child uses spoken language, signed language, or both, organizing the classroom with consideration for auditory, visual, and multi-sensory input allows for students to develop meaning through their specific approach to communication.

Translanguaging, the process of selecting and combining elements of multiple languages into an integrated repertoire, can be incorporated into UDL to enhance the authenticity of a learning environment [63]. Strategies that may be effective for students with disabilities include: guided reading, visual phonics, pre-teaching via chaining and multimedia tools, and peer tutoring that uses metacognitive strategies [20,64]. Chaining, or connecting two languages, can be mediated through multimedia and translanguaging tools such as fingerspelling or ‘sandwiching’ words by signing, fingerspelling, and then signing a word again [20]. Explicit instruction in language patterns is also shown to be an effective strategy for bilingual literacy among deaf students [65]. Fostering translanguaging strategies and multi-sensory accessibility features into classroom design allows general educators to create more inclusive learning spaces for the diverse range of DHH students. We recommend further studies on effective practices to shape these guidelines.

6.2. Auditory Access

Many DHH children in mainstream classrooms use hearing assistive technology (HAT). Technology does not change their hearing status, but may help a child access important auditory information in a classroom. Auditory-based accommodations include personal devices (hearing aids, cochlear implants, etc.) FM systems, audio loops and infrared listening systems. This assistive technology along with mindfulness of classroom acoustics (managing background noise) has shown multiple benefits, including improved performance among both DHH and hearing students, and reduced teacher fatigue [44,66]. For students who are able to relatively access the spoken language of the classroom environment, listening fatigue or concentration fatigue is an emerging concept that is found to affect deaf children who have to concentrate hard for a long period of time on listening or lipreading [67]. Educational audiologists and other specialists can provide recommendations for classroom teachers on how to optimize the space for auditory access [44].

6.3. Visual Access

Increased accessibility for visual input may include ASL interpreters, visual input for classroom content, clear sightlines, and preferential seating. Providing captioning, reducing classroom clutter and visual distractions, facilitating adequate turn taking, hand raising, and other visual strategies are beneficial to deaf students as well as their classmates [44]. Classroom resources helpful for DHH students include interactive whiteboards, ASL applications, computer games, and other accessibility features such as speech to text software. Integrating audio, visual, and tactile media into classroom instruction is a strategy of UDL that is designed to accommodate students with disabilities and benefits all students in the classroom.

6.4. Multimodal Access

For students who are DeafBlind, tactile sign, objects, and drawing can be used to connect meaning—such as large print paired with auditory input, line drawings paired with tactile tangible symbols, and co-drawing about text combined with photographs [68]. For DHH students with additional disabilities, Augmentative and Alternative Communication or AAC resources include simple devices with line drawings and objects or more high-technology devices that include speech generating devices (SGD) or voice outcome communication devices (VOCA) [69]. Through the integration of multiple modalities, educators can guide DHH students through a process of making connections with the

curriculum in a way that is inclusive to students with disabilities and beneficial to all in the classroom.

6.5. Classroom Technology

Using the principles of UDL, educators design a more accessible experience for DHH students by integrating multimedia, visual-spatial language, and technology. The CED (1988) report recommended maximizing use of technology in the classroom including closed captioning, speech recognition software, alerting devices, and braille devices (CED, 1988) [16]. Since that time, captioning features for videos have been integrated in nearly all instructional media and can be used consistently [44]. Speech-to-text in traditional learning environments were noted to help DHH students understand content, take notes, complete homework, and prepare for exams [70]. In a review of research on technology support for the inclusion of deaf students in mainstream schools, Constantinou and colleagues [70] conclude that future studies on assistive technology should focus more on integrating technology into the classroom rather than the tools themselves, suggesting that the current literature provides little pragmatic information for those who aim to integrate technology in the mainstream classroom.

Through the era of remote learning, the landscape of technology use has shifted rapidly with greater use of instructional technology and strategies for integrating audiovisual accessibility features and considerations, such as captioning on media platforms. In an article on accessibility during hybrid instruction, educational audiologist and late deafened author Tina Childress [71] suggested using microphones, maintaining quiet environments, ensuring good lighting directed on the face of the presenter, integrating captioning features for all discussions and instructional media, pinning sign language interpreters, and considering that masks in classrooms will increase the need for additional accommodations such as captioning and interpreting. Voice recognition software applications that can be integrated into instruction using programs such as Otter.ai and through video communication platforms during remote or hybrid instruction (i.e., Zoom, Google Meet, Microsoft Teams, and Cisco Webex). In addition to providing visual access, these applications produce transcripts which can be used for reference [71]. With consistent use of captioning, greater use of voice to text software, and integration of various technologies into classroom design, educators have an increasing capacity to provide inclusive classrooms.

7. Social-Emotional Considerations

Aside from communication access, school placement can be a controversial issue as it relates to social development. Deaf schools have been related in the past to more positive social experiences [18,72,73] while students report feelings of isolation, loneliness, and rejection in mainstream settings [9,35,46]. In addition to isolation within the school environment and lower self-esteem than hearing peers [74], the majority of DHH students in both settings have hearing parents and may also experience isolation and barriers to social development in the home environment. Variables related to higher self esteem include identifying with the deaf community [75,76], deaf parenting [77], and proactive and positive parental involvement in general [78]. Providing deaf students with deaf role models, opportunities to develop social skills through co-enrollment with other DHH students, social skills training, deaf awareness programming, and/or a combination of the above may support their social-emotional wellbeing in mainstream settings. Fostering the cultural identity of DHH students can promote their self acceptance and facilitate greater conditions for academic development. Regardless of a DHH person's dominant language and preferred sensory modality, having a sense of cultural identity and belonging as a d/Deaf person is relevant for their wellbeing.

7.1. Identity

Identity is a socially constructed process. McIlroy & Storbeck [79] suggest that developing a deaf identity includes a process of negotiation in accepting self and finding

one's place in a hearing society. Traditionally, the identity journey for deaf people has two options: address the hearing deficiency with the goal of assimilation and becoming as hearing-like as possible [80,81], or define themselves primarily within the scope of Deaf culture [82]. Leigh [80] suggests that this binary dismisses the experience of biculturalism. The deaf experience, often framed as a deficit or deprivation, can also be defined using other models—such as a linguistic minority (Charrow & Wilbur, 1975; Lane, 1992) [6,83], an ethnicity [84] and a culture [3,82]. Deaf culture includes sign languages, literary traditions, a shared history and a process of developing identity and navigating a hearing world [3]. Deaf identity is formed within intersecting ideas of language, culture, disability, ethnicity and politics [7,82].

Those who identify with Deaf culture or biculturally are more likely to have greater well-being than those who identify with hearing culture alone [75] whether a bicultural identity is deaf oriented or hearing oriented [85]. In a study regarding identity and well-being, Chapman and Dammayer [75] highlight four identities among DHH people that relate to their sense of belonging: (1) Hearing, (2) Deaf, (3) Marginal (4) Bicultural. Among a sample of 742 adults with hearing loss in Denmark, they found that those with a Deaf, Hearing or Bicultural identity had significantly higher levels of psychological well-being than those with a Marginal identity. Identifying as Bicultural or Deaf was also more significantly related to well-being than identifying as Hearing [75]. Having a positive d/Deaf cultural or bicultural identity is not exclusive to DHH students who primarily use sign language. Goldblat and Most [85] surveyed one hundred and forty-one adolescents and young adults, comparing those with cochlear implants to those who are hard of hearing and those without implants. They noted that bicultural identities found among the groups could be either bicultural-deaf or bicultural-hearing dominant depending on a person's orientation to either spoken language or sign language and Deaf culture. They found that having at least one proficient language modality is related to increased bicultural identity, concluding that communication proficiencies are crucial for developing defined identities [85].

The d/Deaf and hard of hearing community is diverse and the way a people label or refer to themselves is personal and reflects their identification with a variety of affinity groups (e.g., racial, religious, ethnic, gender and sexual orientation). Currently many DHH individuals identify as DeafBlind or Deaf Disabled. We acknowledge this evolving definition of intersectionality and identity.

7.2. Peer Interactions

One of the main socio-educational variables in the construction of identity is peer relations [86,87]. A meta-review of literature related to peer interaction found that DHH children are more easily isolated in mainstream settings with fewer communication exchanges than hearing peers, reduced entry into exchanges with peers, and less strategies and opportunities to use to maintain interactions which were often brief or superficial [55]. This meta-review also reported that factors that related to increased communication included use of hearing devices, small or 1:1 exchanges, and quiet environments. While DHH students were more often excluded by hearing peers, co-enrollment models and social skills training programs were found to relate to greater interactions. Integrated settings with deaf and hearing students, coupled with awareness activities are also related to greater interaction between students [88]. Although a critical mass of DHH peers is the goal of co-enrollment practices for language and communication purposes, we reiterate that even a small number of DHH students co-enrolled in mainstream settings—whether within classes, grade levels, or extracurricular programs—may be more socially beneficial than isolated placements.

8. Policy and Programming Considerations

Multiple studies and congressional reports have emphasized that the primary goal of deaf education is language development [9,16,20,22]. In an article on the psycholinguistic

aspect of deaf education, Howerton-Fox & Falk [20] suggest that all DHH students should be considered English learners, whether they are learning through sign language, auditory devices, or other means; and that these students should be provided with multilingual education that affords them the opportunity to develop skills in both signed and written/spoken language [20]. The authors emphasize a need to recognize the diverse language backgrounds of DHH students, who may come from homes that use ASL, spoken English, and/or a variety of other languages. They further emphasize the need for culturally and linguistically responsive pedagogy, which involves developing awareness of the cultural and linguistic diversity of the DHH experience [20,64].

8.1. Language Status

Schools today educate increasingly diverse students who represent an interconnected and globalized world. This diversity includes students with disabilities, students for whom English is a second or even third language, and students with a sundry of cultural experiences. Howerton-Fox and Falk [20] emphasize a need to recognize the diverse language backgrounds of DHH students in the US, who may come from homes that use ASL, spoken English, and/or a variety of other languages. They further emphasize the need for culturally and linguistically responsive pedagogy, which involves developing awareness of the cultural and linguistic diversity of the DHH experience [20]. While there is consensus on the ability of DHH students to achieve to comparable levels as hearing students [9,16,21], an ongoing concern about the status of deaf children entering school is that withholding the sign language to focus on exclusive auditory-oral education has resulted in language deprivation and academic delays [9,16,21].

The LEAD-K campaign (Language Equality Accessibility for Deaf Kids) was developed in response to concerns that DHH children were arriving at schools with significant language deprivation. LEAD-K seeks to promote kindergarten language readiness through early intervention legislation that gives attention to educating families about language milestones, mandates assessments that measure information to families about language milestones and assessments, and uses assessment data to hold state education systems accountable. More than twelve states have passed LEAD-K bills (Payne-Tsoupros, 2019) [89]. Multiple states have also passed a Deaf Child Bill of Rights that requires closer attention to language and communication needs in IEP development; including access to peers and DHH adults. The language in these bills incorporates the 1992 US Department of Education guidelines and has been passed by nearly 20 states [17]. The Cogswell-Macy Act is another advocacy initiative currently gaining momentum. This legislation, through IDEA is designed to expand the resources currently available to d/Deaf, hard of hearing, deafblind and blind students, their families and educators.

Some school districts have also adopted policies with a more culturally responsive approach to the needs of DHH students, giving attention to equity in language and communication resources and cultural identities. In May of 2022, the Los Angeles Unified School District passed a resolution, “Accelerating Achievement through Equity in Action” with the goal of promoting equity in deaf education by granting bilingual programs equal resources as spoken language programs, a resolution in alignment with California’s Deaf Child’s Bill of Rights (Assembly Bill 1836, encoded as Education Code 5600.5). The bill ensures that a bilingual classroom will be the default placement for DHH children, and advocates suggest that the move will counteract bias by elevating and encouraging use of ASL [90].

8.2. Culturally Responsive Program Planning

The notion of culturally responsive education, which has grown in popularity over the past two decades, considers that educators should be informed about cultural diversity, able to recognize the various backgrounds of students, and willing to address the systemic bias that presents barriers in their educational experiences. Darrow [91] suggests that culturally responsive education for students with disabilities can be integrated into instruction by learning about the history and experiences of students with disabilities, monitoring

and addressing any student's alienation within the class social structure, encouraging students with disabilities to assume leadership roles, facilitating their self-advocacy skills, and challenging stereotypical views of disability played out in the media [91]. Using culturally responsive practices such as deaf awareness programming centralizes disability and empowers students as learners, advocates, and achievers, rather than marginalizing their identities through erasure or assimilation that ignores the disability itself.

Disability awareness activities are strategies and programs designed to promote acceptance and inclusion of people with disabilities in public settings [92,93]. Deaf awareness activities can be focused on aspects of their audiological experience such as hearing levels, devices, and spoken communication strategies [92,94], their cultural experiences, sign languages, and sociological context [95,96], or both. The premise of disability awareness activities is that promoting positive conceptions of the disability experience will support greater self-esteem and self awareness for students with disabilities and equip hearing peers and staff with the confidence and willingness to interact with them [88]. In the field of healthcare, studies have shown that deaf awareness workshops and training for medical students and professionals related to a substantially more confident approach to working with DHH people [97].

Learning about the linguistic diversity of the DHH community can benefit all students. Since the implementation of IDEA, the increased presence of DHH students in the mainstream, including those with sign language interpreters, has generated interest among hearing students in the United States regarding ASL and Deaf culture. After hearing students increasingly requested courses in ASL to learn how to communicate with DHH students, ASL courses in the US have grown exponentially and are now commonly accepted for foreign language study in public schools [97,98]. As these courses are more widely offered in public school programs, ASL communities develop within the schools, which are both more enriched and more equipped to provide inclusive experiences for DHH students. Aside from simply learning about Deaf culture and/or ASL, actual integration with DHH students through co-enrollment can provide an even greater benefit for hearing students. One study on integrated classes in a mainstream setting found that hearing students in a classroom with signing students had better signing skills and more positive perceptions on deaf people, although all students received biweekly sign language lessons [52]. For DHH students, learning about sign language and the history of the deaf community can also facilitate their identity development.

The participation of successful deaf adults as teachers, mentors and role models is a recommended practice for facilitating acceptance, awareness and positive conceptions of deaf people [99–101]. In addition celebrating the accomplishments of DHH leaders, advocates, and cultural icons such as Linda Bove from Sesame Street, Lauren Ridloff from Marvel Comics, and Academy Award winner Troy Kotsur is a strategy that highlights the potential for integration of DHH people in mainstream society while reinforcing the value of a Deaf or bicultural identity. Additional strategies throughout the school year include integrating cultural learning activities during International Week of Deaf People in September, International Day of Sign Languages on September 23 [96], Deaf History month in April [102], and Better Hearing and Speech month in May [95].

DHH students are a heterogeneous population and while their needs may appear similar to other disability groups, they have unique needs that set them apart, such as the need to develop auditory or sign language skills (or both), awareness and acceptance of their cultural identity, skills in use/troubleshooting hearing devices if used, and eventually become competent in self-advocacy skills. These skills are not extensions of the general education curriculum but are necessary for the student to access/perform in general education at the level of peers.

9. Conclusions

From the inception of formalized deaf education in the United States within an accessible asylum placement through the advent of special education in the least restrictive

environment classroom placement, we have suggested that authentic inclusion for deaf and hard of hearing students be defined as a safe space that recognizes diverse language needs, communication access, and cultural identity. Strategies related to effective inclusion include accessible design, co-enrollment of deaf and hard of hearing students together with hearing students, deaf awareness programming and attention to social identity, and consistent policy that emphasizes linguistic diversity while equalizing the status of sign languages and of the d/Deaf and hard of hearing community. In her article, *Has Inclusion Gone too Far* (2018) Gilmour [103] weighs the effects of inclusion on students with disabilities, their peers, and teachers and notes: "Inclusion did not become the widespread practice it is today because of a robust evidence base that supports its effectiveness. Rather, it is prevalent because of federal laws that establish special rights for students with disabilities and their parents" [103] (p. 12). Though not referring to DHH children in particular, Gilmour [103], warns against equating the setting or location in which a student with a disability is educated with the actual linguistic, academic and social-emotional fit necessary for the child to make progress.

While a DHH student in the US is legally entitled to an appropriate public education, the factors required to create an inclusive space for DHH students are not always actualized in a regular classroom setting. We contend that in many "inclusive placements," a deaf or hard of hearing learner can be physically included but academically and socially excluded. Students may also be academically included with barriers in accessibility or social identity, or socially included without academic challenge. Given the discrepancies within the realm of special needs, the "least restrictive environment" must be determined on a case-by-case basis. For some students, this is a school for the deaf. For other students, this may be a cluster program with co-enrollment of deaf and hearing students. Others may find an optimal level of access and challenge in a regular classroom. For all students, having DHH peers and a sense of cultural identity relates to greater wellbeing.

Due to factors such as language deprivation, the availability of a critical mass of DHH students, state/district policies, administrative interpretation, and school funding; there is no single concept of inclusive education that is widely and successfully applied among schools and classrooms. Schools and districts still can and should develop and implement a standard policy to identify appropriate placements, design inclusive class spaces, and address the needs of DHH students in all classrooms while providing individualized support as needed. Communication access and cultural identity are major factors that impact the successful inclusion of DHH students. Successful inclusive education happens primarily through accessible design, respect for diversity, and strategies for literacy and language development. While overemphasizing the least restrictive environment has often resulted in isolating and inaccessible experiences for DHH students in the mainstream, more inclusive experiences can be created using UDL and culturally responsive education that integrates sign language and Deaf culture. A multilingual setting that prioritizes effective inclusion of DHH students may be more easily implemented in a specialized program such as a deaf school but we believe these principles can be applied within a variety of other placements that integrate the necessary tools and resources. Students and teachers can learn about inclusion and Deaf culture in any setting, integrating the rich history of deaf education and the linguistic diversity of d/Deaf and hard of hearing people in classrooms with DHH students. Involving all members of the community in deaf awareness programming can assist schools in meeting these goals.

There is general consensus that DHH students are comparable to hearing peers in their capacity for academic achievement and that issues in deaf education stem from deficiencies in the system [9,16,20,104]. We agree with Gilmour [102] that concerns regarding the effectiveness of inclusion for students with disabilities is not with the students themselves but with the failure to critically examine what is successful and what is not successful in order to design educational systems that recognize students' individual needs and result in success for all students. For inclusion practices and DHH children we suggest the following recommendations:

1. Co-enrollment and/or exposure to DHH peers/adults with the opportunity to develop bicultural identity and for the school community to develop deaf awareness.
2. UDL and culturally responsive instruction that considers the specialized needs of DHH students, their cultural and linguistic diversity, and equal status of spoken and signed languages.
3. Policy and protocol that ensures equity of spoken/signed language and the appropriateness of a program over a preference for full inclusion.
4. Research in effective practices in auditory, visual, and multi-sensory accommodations, integration of technology in K-12 classrooms, and the relation of policy to practice in inclusive education for DHH students.

While the majority of DHH students are currently mainstreamed in regular public school classrooms, there are ongoing concerns about accessibility, social-emotional well-being, and monitoring outcomes of students in the mainstream. With UDL, teachers can create accessible spaces using auditory, visual, and multisensory means. With culturally responsive education, schools can guide all students to celebrate the contributions of DHH and develop awareness of their communication needs. To design research on outcomes and effective practices using a culturally responsive approach, Cawthorn & Garberoglio [105] suggest that leading with a deaf-centered framework, which “...is not just inclusive of deaf perspectives but begins with them in mind,” will strengthen the validity of findings and ability to apply them across a heterogeneous population within a variety of settings [105]. To meet the students of DHH students in mainstream settings, educators must strive to include the culture, knowledge, and experiences of deaf people. The principles of deaf schools, which have traditionally provided access to deaf peers/role models and fostered cultural identity can be integrated into mainstream settings. Through co-enrollment of DHH and hearing students and the use of resources from deaf schools, public schools serving DHH students can integrate a greater knowledge of specialized services to support instruction, foster deaf awareness and cultural identity among the school community, and create safe and inclusive environments for DHH children.

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