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Never Heard: The Need for Widespread ASL Education

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Never Heard: The Need for Widespread ASL Education- Increasing Inclusivity in the Classroom

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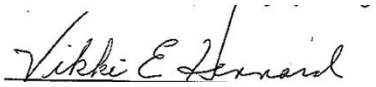

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ABSTRACT

Name: Lauren Roberts **Major:** Elementary Education

Never Heard: The Need for Widespread ASL Education-Increasing Inclusivity in the Classroom

Advisor's Name: Dr. Vicki Hennard

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All students deserve an equitable, and high-quality education. The best education should show students how to use their strengths and skills to their benefit, and help them grow in the areas they are weaker in. In terms of education for deaf and hard of hearing students, there are gaps that need to be addressed. Students who are deaf can experience isolation, poor academic outcomes, and decreased self-esteem. However, with access to a common language in a general education setting, where deaf and hard of hearing students can co-exist, these educational and social gaps can be closed. I argue that implementing a bilingual program in elementary schools that teaches both DHH (Deaf and Hard of Hearing) and hearing students American Sign Language will dramatically increase the quality of education for all students. The many academic, cognitive, and social benefits of learning sign language are abundant in the literature surrounding this research. Learning sign language is beneficial for one's reading comprehension and STEM skills and for one's social and emotional health in the classroom. If students' academic and social lives can be improved using sign language, inclusivity and acceptance in the classroom will undoubtedly increase. When this inclusivity is prioritized, students will leave

their classrooms with a deeper understanding of what it means to be an understanding, empathetic, and kind human being.

Introduction

"I hope I inspire people who hear. Hearing people can remove barriers that prevent deaf people from achieving their dreams." -Marlee Matlin

Being deaf is seen many times as a disadvantage, as a fault or a flaw, or something that would hold someone back from reaching their fullest potential. This couldn't be farther from the truth. Being deaf is a way of life. It is a culture, a community, and a safe space to be unapologetically oneself. The barriers placed on deaf individuals can be removed by collective, positive action. Education is the foundation for making these positive changes in the lives of young deaf students. The quality of life for deaf individuals will greatly improve if students could use their native sign language in the general education classroom and experience true inclusivity with their hearing peers. This thesis will explore the outstanding benefits of a bilingual education program and outline the impact of providing equitable education for all deaf students.

The central question I will be exploring is: How can a bilingual ASL program impact the interpersonal relationships of Deaf children, and improve the inclusivity of all classrooms? This thesis argues that the implementation of a bilingual American Sign Language (ASL) program for both DHH (Deaf or Hard of Hearing) students and hearing students within classrooms will improve the overall social and emotional health of all students and create authentic inclusivity. I will present the many strategies that could be used to achieve this inclusivity in classrooms, the social and emotional benefits of learning ASL, and the overall improved accessibility of language in society. To be a true advocate for deaf individuals and present needed action for inclusivity, deaf individuals' voices and experiences will be honored and highlighted within this thesis. With approximately 11 million DHH people in the US, this call for inclusivity is as

relevant as ever (Mitchell, 2023). Because language and interpersonal communication are linked, the need for students to connect verbally and nonverbally should be fervently pursued. Every individual deserves meaningful relationships and accessible communication. Implementing a widespread ASL education for all students would help make this dream a reality.

Chapter One: An Introduction to the Experiences of Deaf Students: How Inaccessibility of Language affects the Social Lives of Young Deaf Individuals

Education is a right that every child should be entitled to have. Students who are deaf or Hard of Hearing should not be the exception. To access a quality education and explore the endless opportunities of learning, language is the most fundamental aspect. Language inspires connection, and without access to a shared style of communication, that connection cannot be made. Every human being deserves the right to create authentic relationships with their families, friends, teachers, and coworkers. By creating a classroom environment rich in language and community, these connections can blossom. In the highly formational and developmentally complex years of elementary school, these language-rich settings should not just be encouraged, but rather expected. The standard for education should be centered on cultivating the potential of every student and offering them insights into what strengths they can bring into society. This thesis argues that implementing a bilingual American Sign Language (ASL) program for both DHH students and hearing students within classrooms will greatly increase the quality of the social and emotional health of all students while also creating inclusivity for every student. This thesis will outline the current educational and social disparities within the Deaf community, introduce current research about cognitive and social benefits of learning ASL, and discuss what it takes to close these educational gaps and ensure inclusivity for all students. To introduce the need for a setting like this, the first chapter will address the historical and current disparities within the Deaf community.

Too often, the reality of being deaf is to live an isolated, distant everyday experience where one's hearing capabilities are looked at as a great deficit. Nyle DiMarco, a deaf advocate and author, details the experience of being a deaf student in a hearing school. DiMarco discusses growing up in a "deaf utopia" and experiencing the community of being in a family of deaf

people whose deafness spans back generations (DiMarco, 2018). DiMarco talks about the strong friendships, relationships with family, and confidence in school he had during the most formative times of his childhood. This sense of inclusivity was not something remarkable to him, but rather something that was normal (DiMarco, 2018). With a curious mind, a young Nyle wanted to explore the expansive and new path of public school. With a hesitant but supportive initiative to enter public schools by Nyle's mom, he finally joined a mainstream classroom where he could interact with hearing children. Nyle remarks that he told his mom "I want to learn what those students are learning. I want to see what their classrooms are like. What are public school teachers like?" (DiMarco, 2018). His openness and desire to see how a public-school functions was quickly cured by going. He says that "after two weeks of frustration, I came home pleading to go back to the Deaf school. She listened very sympathetically and told me, "Nope, too bad." I was floored." (DiMarco, 2018). He explains that his mom assured him that in a hearing school, there was plenty to learn about "the hearing world." In this new setting, without the community of other deaf students, teachers, and family members, Nyle describes his experience as insightful and says that "I could not be involved in any of the school organizations. My friends never learned enough sign to communicate. And every time I tried to play a sport; I would get benched. The basketball coach told me a deaf kid could never help the team win a game" (DiMarco, 2018).

Nyle's experience is sadly a common experience for deaf students who receive little to no support in a mainstream classroom. Lacking a common language to communicate with his peers and teachers, Nyle faced an isolating, yet insightful reality. Looking into what it means to be deaf in a hearing world gave Nyle the passion and inspiration he needed to attend Gallaudet University and become a famous deaf advocate and author. Now, reflecting on his time in a

public school, Nyle's story is representative of the current gaps that exist in public schools for deaf students. Ensuring that these gaps are closed, and that a public education can provide every student with equal opportunity to thrive, and grow is an imperative step in creating inclusion.

This gap not only exists within the education realm, but within many family dynamics as well. At the elementary school age, families are important stakeholders in providing students with a quality education. The relationships that deaf students have with their parents directly impact the students' ability to perform and flourish in school. With 90 percent of deaf children being born to hearing parents (Mitchell, 2023), this dynamic between hearing parents and deaf children is extremely relevant.

Gretchen Brown Waech, a deaf woman who grew up in a hearing family, discusses the stigma deaf individuals encounter when she says, "Everybody thought that anything that was wrong with me was because I was deaf. If it was not something they could relate to me being deaf, then it was because I was lazy or stubborn. The support I got was not the appropriate support for what was wrong with me" (Alumni, 2018). Deaf individuals like Gretchen know this feeling of isolation far too well (Alumni, 2018). Similarly, her experience of being seen as less than is representative of many deaf individuals' lives growing up. Her parents desired for her to be "normal," and maintained a historically oppressing view that she should learn to speak and assimilate into mainstream culture. Brown Waech knew however that this was wrong, and explains the view of her family, "They did not want me to be around deaf people. They thought deaf people were not smart, not capable; they could not work or do anything. And their view of deaf people was enforced onto me. Even though I knew in my heart, it is not true" (Alumni, 2018). Often deaf individuals can only experience real inclusion when using a common language. Providing young kids with a space to share stories, ideas, conflicts, and their emotions

is an immensely powerful thing. For Gretchen, having this community meant everything (Alumni, 2018). Gretchen is just one voice that highlights the stigma that can exist around being deaf, and her story matters. Discussing these gaps and difficult stigmas that exist within society is the first step to promoting inclusion and making the experiences of deaf students positive and encouraging. In a world with so much diversity and opportunity, these issues require not only conversation, but collective action to make meaningful changes.

Gretchen makes a beautiful point when discussing the diversity of thought within the deaf community as well. DHH individuals may choose to speak, write, or sign in each situation, and their preferred method of communication might vary based on the setting they are in (Alumni, 2018). It is vital to recognize that every deaf individual has the right to express themselves, and no one way of communicating is better than another. Being an ally for the deaf community and proposing arguments for changes in society means that the choices and preferences of all deaf individuals are valued above everything else. In a world where there are many voices and opinions, listening to the voices of deaf individuals is the foundation for making any kind of meaningful change.

To discuss the need for a bilingual approach to elementary education, the current injustices faced by deaf students, their experiences, stories, and the data around the lack of inclusivity within schools and society itself must be discussed. In the United States, there are approximately 11 million people that are DHH (Mitchell, 2023). This number represents the large scale of people affected by the education system's quality. No matter what age you are, the experience that you have in elementary school is a formational and highly valuable time to develop your friendships, aspirations, and strengths. To further contextualize this data and make it specific to the age group being discussed, it is necessary to look at the state of deaf students in

schools. According to the US Census Bureau (2023), there are roughly 308,648 DHH children between the ages of 5-17 living in the US. This means that there is an exceptionally large population of students who require quality support within their classrooms, no matter what type of classroom they are in. Within this population, around 75,000 are on IEPs (Individualized Education Programs), 20.8% are in specialized schools and programs for DHH students, and the rest— 77.4% of 75,000 DHH students who have an IEP (Individualized Education Programs) in PreK-12 programs—are included in general education (US Census Bureau). Because 77.4% of students who are DHH are in a general education setting, increasing the quality of their education with the implementation of a bilingual program is vital.

Deaf students lack not only a common and accessible language to communicate with their peers and develop peer relationships, but also a hope for equal opportunities in school and the workforce. Students may suffer silently, as they miss opportunities to form meaningful relationships, or struggle to grasp a lesson because they lack the language needed to understand. Lacking this language is socially detrimental to the development of their brain's language processing skills.

Many deaf children that grow up without sign language experience these damaging effects that are defined as linguistic neglect. Linguistic neglect is defined as an insufficiency in language input, resulting in poor mental health, delays in cognitive development, challenges in academic settings, and a lack of prospects for job opportunities. It is caused by many unseen factors like negative historical connotations, inequalities in education, damaging stigmas, and systemic oppression (Marks, 2020). This becomes a significant issue because a deaf elementary school student is in their prime language and content learning years. In fact, research proves that children who do not receive recurrent, accessible language before the age of 4 may never reach

fluency in any language, which leads to stunts in cognitive development (Marks, 2020). Language accessibility is therefore of the utmost importance within early education programs. Allowing students to foster these language skills from an early age should be a right, not a privilege, for all young children. Beyond a deaf child learning either spoken or signed language, there is evidence to suggest that ASL is the most reliable way to ensure full language input for a deaf child (Cordano, 2022). This means that even if a child is learning spoken English, and utilizes technology like cochlear implants or hearing aids, the use of ASL at a very early age can develop their language more completely. Research also shows that manual language develops cognitive structures the same way spoken language does (Marks, 2020). In other words, deaf children who grow up bilingually have the most complete language input. The manual style of ASL is not cognitively different than learning spoken language. This strengthens the argument that a bilingual program will only build the language development of all students, deaf or hearing. If all students are receiving these developmentally strengthening supports, the potential for their academic and social success increases indefinitely. Additionally, it is evident that the consequences of linguistic neglect cost the child the ability to be fluent in any language. This type of neglect should clearly not be ignored. If young children are stripped of the opportunity to become fluent in a language, the difficulties they will experience in school and in life outside of education are heightened.

However, the development of linguistic neglect can be easily avoided by educating oneself, and understanding the current biases that exist against DHH individuals. One of the disparities that has historically, and currently oppressed deaf students is the enrollment of DHH students in hearing schools without ASL instruction. Research shows that “while attending schools specifically for the Deaf used to be a common practice, in 2013 nearly 75% of the

80,000 deaf school children in the United States had been mainstreamed into public hearing schools" (Marks, 2020, p.1). This means DHH students are not enrolled in an inclusive setting where their native and preferred language is offered.

Rather, they are in a mainstream setting where linguistic support is limited. These areas of deficit are evident in the data around educational gaps. Marks found that "The average 16-year-old deaf student has an 8-year-old reading level and is 4 grades behind in math skills" (Marks, 2020, p.1).

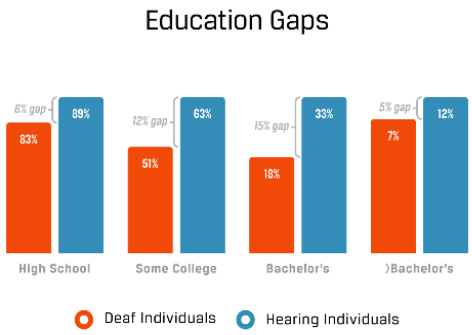

Figure 1.1

Not only are DHH individuals experiencing a gap in their education, but also a gap in their ability to advocate for themselves. Deaf individuals who self-reported abuse experienced one, if not many, kinds of abuse before the age of 16; 48% report emotional abuse, 44% report emotional neglect, 44% report physical neglect, 40% report physical abuse, and 31% report sexual abuse (Marks, 2020). This means that deaf children are experiencing a real barrier in communication, which sadly leads to an increase in abuse. These dark numbers represent a much larger problem that can be connected to the linguistic neglect deaf children experience.

Integration means nothing if the access to education and social connection remains segregated. The statistics are maddening, yet the numbers show a clear gap in the quality of education for all students. The data shows that there is a 15% gap between DHH and hearing individuals who have a bachelor's degree (Figure 1.1). Without access to higher education, the

opportunities DHH individuals have are limited. This disparity presents itself in the labor gap too, which will be discussed later.

The research reports that an estimated 70% of deaf children experience linguistic neglect (Marks, 2020). This staggering 70% of students are at serious risk of linguistic deprivation- a neurological disruption in the cognitive development of a child (Marks, 2020). Not only does linguistic deprivation harm a child's academic and social performance during their early age, but it can also cause serious mental health disorders later in one's life (Marks, 2020). With mental health, academic success, and social connections of deaf students at stake, creating an inclusive space for all students is vital. This unwavering need for engagement and action cannot be ignored and has been building for over 200 years. Historically, American Sign Language has not always been recognized as a legitimate form of communication. It was not until 1960, when William Stokoe, a famous linguist and researcher, declared that ASL was linguistically equal to spoken languages (Marks, 2020). Before this, ASL was seen as a collection of gestures with no formal structure or meaning (Marks, 2020). The principle of recognizing sign language as a real, formal language is instrumental to recognizing deaf culture, and its people as a group that demands respect and equality of opportunity. To grow up in a society that views your language as a simple collection of gestures that have no linguistic meaning implies that deaf culture itself has no place in society. This view of deafness as something detached from society is wildly damaging and cannot be allowed in schools or society.

The historic context of deaf culture, or rather the lack of deaf culture, is a pertinent facet of deafhood to explore. Before 1817, deafhood was viewed as a sin. For hundreds of years, deaf individuals were thought to be damned, because of their inability to speak or hear (Marks, 2020).

DHH individuals were not entitled to an education, or participation in religious rituals or communities (Figure 1.2).

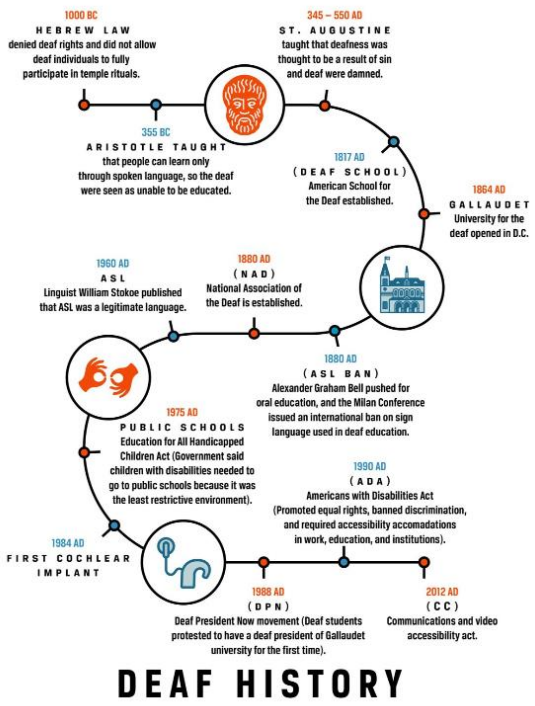

Figure 1.2

It is also true that many institutions historically perpetuated a negative view of the birth of a deaf child because it was treated as a disease (Marks, 2020). This mindset of deafness being a "loss" itself is a negative stigma that has plagued the deaf community for decades. To dismantle this perspective, and instill a standard of empathy and acceptance, a bilingual program could inspire inclusion. For years, DHH individuals have advocated for their Deafhood to be viewed as a respected and accepted identity, because their language was continually seen as a foreign culture that aimed to be assimilated into a speaking society (Marks, 2020). Especially in the US, where the diversity of cultures is said to be celebrated, this group of individuals should be no exception. Differences in hearing do not limit ability. They inspire creativity and offer a different way of seeing the world. This difference in perception of language is a beautiful celebration itself of how diverse and adaptable the human species really is. Deaf individuals do not need to be "assimilated into a speaking society." Deaf individuals need to be respected for the creative strengths and endless contributions they bring to society.

With the historical context of DHH education in mind, what is the current state? How does the quality of education for current DHH students compare to earlier times? Many deaf students are currently educated in oral programs, due to the increase in cochlear implants which give deaf students the ability to hear more typically (Marks, 2020). The focus of an oral program is to teach DHH students how to present more similarly to a hearing person by lipreading, using cochlear implants, and in some cases speaking. In an oral program, students are taught using Sign Supported Speech (SSS) which is a form of language that uses the structure of English with some ASL signs. This form of speech, however, has not been scientifically proven to close language gaps for DHH students and can be a detriment to their ability to learn and use oral and signed language (Marks, 2020). In other words, deaf students are forced to learn oral language and prioritize speaking. Sign language is not currently accessible to students in general education. A bilingual program in contrast to an oral program could provide every student, DHH or hearing, with the ability to use a common language that is highly beneficial for both academic and social gains. These gains will be highlighted later in more detail.

Another facet of current deaf education is the use of ASL interpreters. Although these interpreters certainly provide a strong connection between spoken and signed language, research shows that students who use interpreters comprehend around 60-75% of the content, while their hearing counterparts comprehend 85-95% of the content (Marks, 2020). The issue does not lie within the interpreter's ability to communicate the content, but rather the disconnect between the accessibility of instruction for deaf students compared to hearing students. A hearing teacher is more likely to craft lessons and activities that are built for a hearing individual. This leaves the interpreter in a space where they are translating the exact words of the teacher. In turn, DHH students are receiving instruction that is simply not accessible. This chapter highlights the

education and social gaps students face every day. The following chapters will seek to answer the question “How can a bilingual ASL program impact the interpersonal relationships of deaf children and improve the inclusivity of all classrooms?” through detailed analysis of the literature surrounding deaf experience.

Chapter Two: The Science Behind the Academic Benefits of Bilingualism

Education at its finest is adaptable, creative, and inclusive of all students. It pushes every individual to find their strengths, learn from their struggles, and use this knowledge to pursue their passions within the real world. A bilingual education, where DHH students and hearing students alike are offered two languages to learn, offers invaluable benefits. If inspiring inclusion and integrating DHH students with their peers is not enough, the academic and cognitive benefits of bilingualism are remarkably convincing. From the National Science Foundation (NSF) at Gallaudet University, a study found that "bilingual deaf children have identical benefits to those found in children who are bilingual in other languages, including more robust use of the language areas of the brain, enhanced social and interpersonal understanding, and stronger language analysis, reading, and reasoning skills" (Cordano, 2022, p.16). In other words, students that are DHH and can use both English and ASL are receiving the cognitive benefits that come with learning another language. These skills in language analysis, reading, and reasoning all provide students with the toolbox they need to excel far beyond the classroom. As an educator or a parent, knowing that your child is not only capable of surviving in the world, but thriving in it, is the epitome of success. Research by the NSF also supports the idea that both signed languages and spoken languages are processed in the brain in the same area (Cordano, 2022). This means that the brain does not discriminate between spoken and signed languages nor deem one more important. This spoken language is not primarily important to language development, but rather is biologically equal to signed languages; these areas in the brain are not exclusively built for sound but are built for processing the patterns used to learn language (Cordano, 2022). Because the brain does not prioritize spoken language over signed language, but instead processes both kinds of languages equally, the possibilities for strengthening the language processing part of the brain increase.

Understanding that there is strong science behind the way language develops bolsters the need for a bilingual approach. Someone with a lack of knowledge might ask the question: If DHH individuals only use sign language, how will they ever learn to speak English? However, it is evident that exposure to sign language does not in any way delay the development of spoken language. Further, exposure to ASL at a young age allows children to strengthen their vocabulary and reading skills more than their hearing peers only learning English (Cordano, 2022). Students, whether they are DHH or hearing, can reap these linguistic benefits and make strides in their vocabulary and reading comprehension abilities. For elementary school students to be exposed to these benefits and grow in their linguistic skills, the implementation of a bilingual program is highly valuable. The language development of signing individuals is not negatively impacted by their nonverbal communication but rather improves their ability to harness their vocabulary and reading acquisitions. Research also suggests that deaf bilinguals see signs in ASL in their own mind when they are reading English words (Fish & Morford, 2012). This visual connection between signs and written words is wildly beneficial for students learning to read. In current reading curriculums, and education research, the connection between written words and images and concepts of the words within one's mind space is an incredibly useful tool for comprehension (Fish & Morford, 2012). If students who sign can not only develop their vocabulary and reading skills more, but also experience this text to brain connection, the benefits in literacy alone are serious considerations for the introduction of a bilingual program.

Someone who has no connection to the DHH community could easily consider these impressive benefits because they are so valuable. Now imagine the perspective of a parent, teacher, sibling, or friend. These academic and cognitive gains are life changing. These skills like reading, reasoning, and vocabulary attainment provide students with the confidence they need to

soar. Knowing one's own capabilities allows a child to build dreams and aspirations.. Literacy and language open the doors to academic success. Having these foundational skills strengthened by a bilingualist approach to education is an indispensable cause.

The question of bilingualism's benefits certainly raises more inquiry about what it means to speak more than one language. So why is being bilingual so relevant? Why does it matter that DHH students, as well as their hearing peers, could benefit from these cognitive and academic assets? The ability to communicate in more than one language offers a chance to explore the beauty in diversity. A research brief by the NSF found that this increased ability to communicate offers individuals access to communities that are diverse, as well as experiences and perspectives that are divergent from someone who is monolingual (Fish & Morford, 2012). This matters because the desire to connect with people who might be different than oneself is a very real feeling. If DHH students can authentically communicate with their peers, their social and academic lives will flourish. If students have a more expansive vocabulary, as well as a more well-rounded view of the world- from an academic perspective, their work will be higher quality, and more meaningful. It is also true that the society we live in today is truly a multilingual and multicultural place; the ability to interact with others who speak a different language and are representatives of a different culture is a highly valuable and useful skill (Fish & Morford, 2012). Being able to learn about other cultures beyond one's own is one of the most exciting parts of learning. And in the world today, multiculturalism will continue to grow and prosper. So, finding the value in this pluralism is a skill that will forever pay off. If students are exposed to cultures beyond their own, especially the rich and diverse perspective of deaf culture, skills like empathy and tolerance cannot help but be developed alongside the academic developments taking place. These benefits of cultural exposure will be further discussed as well in the context of social

emotional health in a later chapter. Before that, however, there are more cognitive benefits of sign language bilingualism that are worth exploring.

Beyond academics, there are very evident cognitive benefits of bilingualism. The same study by the NSF found that bilinguals demonstrate more developed capabilities for attentional and inhibitory control, have more efficient conflict resolution, and an improved performance in working memory (Fish & Morford, 2012). This study included both DHH individuals and fluently signing hearing individuals. The use of both test groups was an intentional choice to represent the possibilities for the integration of hearing and DHH individuals. Additionally, this means that not only DHH individuals benefit from these cognitive advantages, but hearing individuals who sign as well. Improved attentional and inhibitory control, conflict resolution, and working memory performance are skills that can apply to every subject, job, and relationship (Fish & Morford, 2012). If students can better focus their attention on the task at hand, and their ability to pour more effort in, they can produce higher quality work to be proud of. Giving students these advantages allow them to build the confidence they need to tackle more meaningful work. As previously mentioned in Chapter One, in a population where DHH individuals have lower self-esteem than their hearing peers, this boost in confidence is highly valuable. These small chances to improve confidence may seem like a basic or foundational step in improving deaf individuals' self-esteem and academic performance, but the influence they can have is truly monumental.

So far, research suggests that bilingualism provides benefits within literacy skills like reading, writing, and reasoning. Research also presents improvements in working memory, inhibitory control, and conflict resolution (Fish & Morford, 2012). But what about STEM? One of the most critical areas of education, and a predictor of success in the job market, STEM is

ever-growing. So how do these cognitive benefits of bilingualism present themselves in science, technology, engineering, and math?

In a comprehensive study by the Neuroscience department at Gallaudet University, done on "deaf fluent signers, hearing fluent signers, hearing non-fluent signers, and hearing non-signers," Emily Kubicek and Lorna C. Quandt found remarkable data on spatial reasoning skills. To test spatial reasoning skills, a crucial component of STEM, the team conducted an electroencephalography experiment and assessed accuracy on a classic mental rotation task (Kubicek & Quandt, 2020). Being able to rotate an object or shape visually in your mindrequires skills needed to complete work in STEM.

The study presents an interesting take on STEM performance and the connection to language. Their research asks the question: does the use of sign language improve one's spatial reasoning ability? Because the science suggests that "work in the past two decades has repeatedly shown a correlation between spatial ability and academic achievement" (Buckley, 2018, p.5), there is a compelling argument that improved spatial skills ensure improved academic performance. But what is the mental rotation test? Kubicek (2008) explains that mental rotation is a cognitive process in which a mental image is rotated around an axis in three-dimensional space. one of the most studied factors of spatial abilities research is mental rotation performance, so studying this diverse group of DHH signers, hearing signers, and hearing non-signers, explores the relationship between ASL and spatial reasoning. The data suggests that deaf native signers as well as hearing individuals who sign fluently performed better on tests of mental rotation than those who do not sign, while also performing more accurately in their ability to remember object orientation, which is a valuable aspect of mental imagery (Kubicek & Quandt, 2020). These findings provide an evidence-based argument for better STEM abilities due to

using sign language. Because STEM is a large interest of students and a highly sought-after career path, these findings show the significance of using sign language in the classroom. In an ever-growing and changing world where technology becomes more prevalent in the everyday lives of humans, having students more prepared to pursue these STEM-based jobs is a strength that can and should be drawn on. Opening this male-dominated, nondisabled-dominated field to more populations of people opens the creativity and adaptability of the profession itself. Including other groups of people can only widen the possibilities of technological and societal advancement.

The research presents a variety of intriguing findings, but the results deserve to be discussed further. The question: "why are signers so much better at spatial reasoning?" is worthwhile to answer. Kubicek (2020) argues that speakers of sign language are continually manipulating and perceiving signs within space to communicate an endless number of abstract concepts. Like gymnasts (Ozel et al., 2002), engineers, or airline pilots (Dror et al., 1993), sign language users practice rotational transformation as a part of their daily life" (Kubicek & Quandt, 2020, p.4). This constant use of mental rotation allows signers to develop skills that can be used in science, math, engineering, and technology. The evidence that hearing signers outperformed their non-signing peers strengthens the need for both DHH and hearing students to use sign language.

These expansive cognitive benefits support the idea that there is no need to choose between languages, and rather there is an opportunity to choose both languages. We now know that the need for ASL has not decreased but is greater and more urgent than ever for deaf children to gain all possible biological, cognitive, and language advantages (Cordano, 2016). This means that these cognitive benefits can be applied to all students, no matter their hearing

ability. Overall, this means that creating a bilingual environment gives every child the opportunity they deserve to explore their academic potential. In settings where DHH students and hearing students alike can reap the academic and cognitive benefits of sign language, the possibilities for success are endless. Giving DHH students specifically more confidence in their academic abilities allows them to better discover their strengths and interests. In a truly inclusive setting, a young deaf girl who dreams of becoming an engineer, or a young boy who aspires to be a math teacher, or a child who has a passion for writing, are provided with the assurance they need that they can do anything. This gift of possibility is supported by academic capability. Without these successes, and boosts in intellectual confidence, a world of opportunities remains untouched.

Chapter Three: Exploring the Social and Emotional Benefits of Integration

Beyond the academic success of DHH students in an integrated classroom lies the potential for more DHH students to feel a sense of belonging at school. A sense of community and safety within the classroom culture can help foster a quality education. For students to truly thrive and reach their full potential, relationships between teachers and students, as well as students' relationships with each other, must be valued and built upon trust and acceptance.

Too often, deaf students who learn in mainstream classrooms feel a sense of otherness, or visitorship, where the students in their classroom feel more like strangers than supportive peers (Yiu, 2014). However, in a true inclusion model, DHH students who are being accepted into the school/class community gradually develop a feeling of belongingness, or "membership," (Yiu, 2014) which is a key condition for building social connections. Fostering these peer connections and creating relationships is built upon the DHH student's perspective of themself, and how they fit in (Yiu, 2014). Once they are viewed as "members" by their school, they are seen as common citizens of a school's overall culture, who uphold shared values (Yiu, 2014). These shared values can connect all students and fill them with a sense of purpose and fulfillment. Deaf students who had a bicultural identity had better self-esteem than their peers who were not integrated. To foster a sense of confidence and pride in their Deaf identity, building peer connections and finding community among hearing individuals bolsters the psychological well-being of deaf students (Yiu, 2014). Creating positive relationships with peers and building their feelings of membership and belonginess is foundational for strengthening their Deaf pride. This is especially true for DHH children born to hearing parents. That feeling of distinction and otherness can create barriers to acceptance and pride early on. Evidence shows that although full acceptance of

hearing loss can take time, having connections with both deaf and hearing peers can accelerate the positive outlook on their Deafhood (Yiu, 2014).

Another way classrooms can promote increased self-esteem and acceptance is through the role of a deaf teacher. Evidence shows that a deaf teacher improves deaf students' comfortability in the classroom and offers them a direct link to the deaf community (Yiu, 2014). This also tackles another disparity faced by deaf adults as "only 53.3% of deaf people were employed, compared to 75.8% of hearing people. This is an employment gap of 22.5%" (Schwartz, 2022, p.2). Employing more deaf teachers can increase inclusivity and help close the employment gap. This alternative method called coteaching can offer a variety of social and emotional benefits for DHH students because of the teacher model of a deaf and hearing relationship. Having both a hearing teacher and a deaf teacher who signs increases deaf students' self-esteem (Kluwin, 1999). In fact, there is no gap between hearing students' and deaf students' perceptions of themselves in relation to positive self-esteem (Kluwin, 1999). Interestingly, having a deaf role model within the classroom offers benefits to all students, whether they are DHH or hearing; increased acceptance and empathy for others can be fostered in a classroom that utilizes coteaching and integration (Yiu, 2014). Even the presence of a deaf teacher for hearing students increases the acceptance and empathy they hold for those different than themselves. The wider impact of fostering these skills of empathy and tolerance can change the views children grow up to hold as well. If young children are exposed to the diversity of abilities in the world and interact with people who have alternative ways to see and experience the world, the perceptions they hold about people with disabilities will be cultivated in such a way that allows future generations to promote more positivity and care.

At the elementary school age, friendships are a fundamental part of growing into oneself. Peer relationships inspire belongingness, increase sense of purpose, and offer support for challenging stages of life (Mayo Clinic, 2022). Beyond the basic benefits of social inclusion and friendship, developing empathy for those who differ from oneself is a key benefit of integrating DHH students with their hearing peers. And because the number one barrier to peer connections is communication differences (Bowen, 2008), the need for a common use of ASL is key. The benefits of integration offer an optimistic look into what an inclusive program could achieve. Friendship is one of the largest indicators of happiness in life (Mayo Clinic, 2022). Creating spaces where every child is welcome, no matter their ability to hear or not, is a vital aspect of building inclusive schools. If children can connect in this way, the larger impacts of a more connected society could span for decades to come.

Within an inclusive program, hearing individuals improve their attitudes towards deaf students as well. Students who previously felt sorry for their deaf counterparts reversed their beliefs over time and began to view them as equal members of the classroom community (Bowen, 2008). Even though hearing students remarked that they still felt sorry for their deaf peers, it was revealed later that they only felt sorry that deaf students were teased more often than their hearing friends, rather than feeling sorry for their loss of hearing (Bowen 2008). These friendships also grow over time, and in one study, students were more likely to socialize during lunch, recess, and outside of school when they were a part of a co-enrolled classroom (Mcain & Antia, 2005). Outside of the classroom, if students could use the common sign language, these social and emotional skills developed during social play and leisure time can change the lives of so many deaf students as well. It is also worth noting that the many gaps in social relationships between DHH students and hearing students exist because of a lack of a common language.

Research shows that DHH students are more likely to initiate communication with their hearing peers, but hearing students hold a sense of hesitation in how to communicate with them (Xie et al., 2014). Creating a setting where hearing students can learn ASL alongside their deaf friends is an imperative step towards real inclusion. If students cannot share a common language, the chance of creating authentic relationships is less likely to happen.

Chapter Four: Flipping the Script: Seeing Deafness as an Identity Not a Deficit

Too often, the world sees Deafness as a loss to be grieved. Often parents are consoled for the loss they face, and deaf children grow up in a family that truly views this difference in ability to be a lifelong impairment. In reality, the Deaf community has made monumental and meaningful strides in creating a sense of pride in the Deaf identity. Instead of viewing their deafness as a disability that limits their capabilities, young students like Lizzie Sorkin choose a much more life-giving mindset. In her words, "I am deaf first before being a woman, before my faith, my sexual preference, my interests," said Sorkin via e-mail. "I didn't see my deafness as a problem. I did not need to be fixed" (ABC News Personal Interview, 2006). Deafhood is not a source of shame that students should be sheltered from in any way. Reinforcing positive self-image and fostering a culture of acceptance and pride is vital to the well-being of DHH individuals.

When discussing the importance of accepting deaf individuals' different forms of expression, Danielle Guth says it best: "Some of us, like myself, personalize our hearing aids or hearing-assistive technology to show some self-expression. I have often heard people say, "Really, why would you want people to see your hearing aids? Wouldn't you want them to be invisible?" My answer is always, "No, this is who I am and part of what makes me me. I am never ashamed of my hearing loss. It is something I am proud of" (Guth, 2021). For her, the hearing loss she experiences is a fundamental aspect of who she is. Removing that part of herself to better fit into society would be like stripping away her whole identity and self-expression. Deafhood is not a loss. What is truly a loss is the sad fact that many people still see it in that way.

Nyle DiMarco, a deaf advocate and author, in his TedTalk, *Making Education Accessible to Deaf Children* (September 2018), stated that when asked if he wished he were not deaf, his

response was “I have never wished that because I love who I am. My culture, something I embody and cherish has always been deaf” He talks about the example of going into a job interview, competing against hearing peers. He explains that viewing himself as less than the hearing applicants and focusing on the reasons he is not good enough is the most assured way to not get the job. Instead, he talks about reframing his deafness as a great strength the other applicants lack.

His belief that his deafness is an asset surely set him apart and reinforced his sense of pride and acceptance in being deaf (DiMarco, 2018). Nyle’s perspective represents the possible self-love and empowerment deaf individuals can find with the right support and encouragement. He talks about growing up in a family made up of twenty-five deaf people and being a fourth-generation deaf man. This experience gives him a special and unique system of support where he was given the opportunity to thrive. Without the rich community he was brought up in, DiMarco admits that he would not have been so lucky (DiMarco, 2018).

If school systems could create the unconditionally supportive and accepting community DiMarco grew up in, the possibilities for inclusion and empathy would be endless. Even though he experienced a fully deaf community, a program where students could communicate together and experience full inclusion socially and academically could provide similar benefits.

Empowerment for any student is key to their self-esteem and academic success. In recent years, the term “Deafhood” coined by Patty Ladd in 2003 has been adopted by the Deaf community. Deafhood refers to the mindset that being deaf is not a disease to be cured, but rather it means being a part of a beautifully diverse culture of people adding profound value to the world. Because the roots of oralism haunt the history of deaf education in the US, the consequences of forcing an oralist culture upon young generations are clear (Silvestri &

Hartman, 2022). Oralism refers to "the system of teaching deaf people to communicate by the use of speech and lip-reading rather than sign language" (Oxford Dictionaries). By teaching deaf individuals to communicate in this way, the beautiful complexity of ASL, along with the unity of a common language is simply taken away.

It is essential to acknowledge that while using the term Deafhood is the viewpoint of many deaf individuals, some hold another perspective. The use of cochlear implants, and a more oralistic approach to viewing Deafhood does certainly have a place within deaf culture. Like any culture, there are complexities, and the most imperative point to recognize is that every deaf individual has the right to create their own disability identity. While the research and focus of an ASL centered argument tends to favor the use of sign language, and criticizes the history of oralism, the voices of *all* deaf individuals deserve to be honored and heard.

As far as what this complexity looks like in education, there is a rich history to be explored. In the last 120 years, deaf teachers and students have been removed from the mainstream education scene, with their use of sign language deflated (Silvestri & Hartman, 2022). Under the guise of supporting students in integrating into society, oralism seeks to teach students lip reading and speech over signing, as well as the idea that their Deafhood is something to be cured. Cochlear implants, if installed during infanthood, allow the deaf child to hear and speak as a hearing child would (Barr, 2018). Although this is a seemingly beneficial use of technology, many deaf families view cochlear implants as a blatant disregard for the culture of Deafhood (Barr, 2018). By speaking sign language, deaf individuals can unite in their ability to overcome the prescribed disability to communicate that society places upon them (Barr, 2018). Sign language is not only a means of communication, but rather it is clear defiance of the box society places deaf individuals into. The use of sign language also illustrates the deep desire of

deaf individuals to communicate with others in a meaningful way. If students that are deaf and hearing can share this common language, the possibilities for deep, meaningful friendships and relationships are endless.

Too often, society characterizes disability as a loss to be grieved for by the individual and their family. Growing up feeling as if there is something to be cured within oneself, based on an uncontrollable trait assigned at birth, is a feeling no child deserves to have. Rather, society should see Deafhood as an opportunity to explore the endless forms of human communication, and foster a culture where children feel accepted and proud to be who they are. Elementary school is one of the most formational periods of a young child's life, and building a space where students can experience a sense of safety and recognition for the people they are is not only an idealistic view of education, but a basic right.

Chapter Five: Closing the Gap: Creating an ASL Program for Elementary Students

This disparity in accessibility calls for a systematic change. The benefits, along with the moral arguments for implementing a program are clear. The question remains: how do we make these dreams a reality? This chapter will explore the many possibilities of a bilingual program and highlight schools from around the world that have already made it a shining success.

As previously mentioned in Chapter One, research shows too many deaf and hard of hearing children beginning pre-kindergarten experience language deprivation, which leads to academic delays (Cordano, 2016). This means that students are entering a new academic and social space without the foundations they need to make peer connections or perform intellectually. So how do we close this gap in the social, emotional, and academic lives of deaf students compared to their hearing peers? What would an ASL program look like within an elementary school? By starting ASL education at an early age, students will be able to build empathy, make connections, and gain all those benefits at an early age. Studies show that early exposure to ASL and English together is beneficial for both hearing and deaf children. DHH children with access to early language exposure have lifelong brain development changes and improved metacognition (Cordano, 2016). To consider how to achieve this, this chapter will discuss different models of successful school programs.

The TRIPOD program was a bilingual education model created in 1982 by Megan Williams, a mom of a deaf child and a hearing child. The program was modeled around a Montessori, or holistic view of education, and prioritized a student-centered approach (Rochester Institute of Technology, 2020). Both DHH students and hearing students were educated in one space and were taught using spoken English and ASL. This philosophy demonstrates a total language approach where both English and ASL are used to give students complete access to the

content being taught. Because this program proved itself to be so successful, the Burbank Unified school district in California adopted it, and as expected many people moved to enroll their children (both hearing and deaf) into this school district (Rochester of Technology, 2020). Because of this school's popularity, and its success, deaf teachers were paid to earn their Montessori teaching licensures to educate this population. The effects of this program were far-reaching and support the argument that teaching in an inclusive setting can make an undeniable difference for all children. The program's graduates went on to become interpreters, advocates, and educators. The friendships and relationships built within this program signify the peak of an inclusive and diverse educational experience. If public schools were to adopt the bilingual model, the possible outcomes for both DHH and hearing students would be brightened with opportunity. All students deserve a quality education, and giving every child access to a common language begins with a mutual understanding of how this can be achieved. A program that is both comprehensive and achievable might seem hard to create, but programs like TRIPOD, among others, prove otherwise. To further argue the need for a program like this, an international study deserves some recognition.

A study from the UK, where deaf students and hearing students were taught alongside one another, shows that integrating both sign language education and content can be effective. It involves a hearing teacher as well as a deaf teacher who teaches exclusively in BSL (British Sign Language), working alongside one another to instruct their small group of students. The hearing teacher went into this experience with no prior knowledge of BSL and came out with a better grasp on signing and deaf culture. The goal of this program was to analyze the academic and social/emotional outcomes for all students, both DHH and hearing (Daniels, 2001). Within this model, the hearing teacher serves as an example to hearing students for bridging the

communication gap and taking a leap to learn. Because the hearing teacher of hearing children knew no BSL, it was difficult for her to communicate in the beginning. She directly and indirectly learned BSL from the deaf BSL tutor. Soon she began to use signs in storytelling and in classroom management. This ability bolstered her confidence, as she had envisioned a barrier that was quickly evaporating.

Teachers suggest that the students who recognize the teachers' ability to communicate back and forth with them feel a greater sense of community and belonging (Daniels, 2001). The hearing teacher truly models acceptance and a deep willingness to learn alongside those that are different from her. Changing her ideas about communication and what teaching requires demonstrates that all students, both DHH and hearing, can deepen their understanding and empathy for those around them. If students did not have teachers to serve as role models, problem solvers, and systems of support, a program like this would absolutely be difficult to implement.

However, within the world of education, the room to grow and change one's own thinking is ever-growing. The premise of inclusivity relies on those who implement it to serve as pillars of respect, humility, and integrity. Having deaf and hearing teachers working alongside one another can create ripple effects for all students, within their academic and social lives. In creating a widespread ASL program, it is certainly relevant to consider this idea of co teaching, where hearing and deaf teachers could educate alongside each other. The employment gap for DHH individuals is a stark reminder of the biases and barriers that still prevent fully capable individuals from being hired.

Workplace discrimination and a lack of access to certain industries hinder the wildly talented and skilled deaf population from reaching their highest potential. While only 20.8% of

hearing people are not in the labor force, 42.9% of deaf people are not in the labor force (Statistica, 2024). Research also shows that while 75.8% of hearing people are employed, only 53.3% of deaf people are employed (Statistica, 2024). This gap is a clear call to action. Providing deaf individuals jobs within education is not only incredibly meaningful for DHH students, but also so valuable to deaf adults. Not only would this be a model of inclusivity for students, and integrate the teachers together, but it could also provide more deaf individuals with jobs. I would argue that even a paid mentor program or tutoring for hearing teachers from deaf educators could be an opportunity that would create an accessible and inclusive classroom for all.

It is certainly true that while this model of coteaching is the ultimate peak of inclusion and representation, because of teacher shortages and a lack of funding, the reality is that enough deaf teachers could be challenging to find. The US department of education reports that in every state, there are teacher shortages in multiple areas for the 2022-2023 school year (Forsht, 2023). These numbers contextualize the great need for teachers, and a greater need for Special Ed, Math, and science teachers. If DHH teachers could become categorized as a high need population, and receive higher pay, the retention rate and hiring rate could grow in an unbelievably valuable way. Similarly, if deaf teachers could be compensated for their higher education, or incentivized to become credentialed, the numbers of DHH teachers hired could increase significantly. Hiring deaf teachers is invaluable. However, if there was to be a lack of deaf teachers, the next step would be hiring teachers with advanced degrees in Deaf culture, sign language, and education of DHH students. Offering a program with highly qualified teachers is the pinnacle of inclusive education, and this program cannot exist without them.

Many people might ask what makes ASL more valuable or relevant than other languages within schools. While second language acquisition is truly a valuable skill no matter the

language, the impacts of learning ASL present a diverse range of cognitive and social benefits for all students. A bilingual program does not discount the benefits of other languages but highlights the relevance and value of ASL. The UK study demonstrates the idea that sign language differs from other second languages in the sense that it truly connects every student, even when the teachers are not present. The study shows that when left alone, students who are learning sign language tend to use it outside of the classroom, and use it in social settings (Daniels, 2001). It is also true that other second languages are often isolated, while the rest of the content is taught in the first language or majority language of students. However, the study illustrates the benefit of integrating sign language into lessons on social skills, math, storytelling, geography, and literacy (Daniels, 2001).

Closing this employment gap is no small feat; however, the outcomes of children's interpersonal development and quality of life are surely worth it. The National Deaf Center suggests that bold systemic changes are needed to promote more inclusivity in schools. These policies need to address the injustices deaf students face within the education system. This program model was also attempted in the US and was successful at an elementary school in Florida, using a multisensory curriculum that involved auditory and visual instruction. From the teacher's perspective, creating a successful bilingual and bimodal program requires a deep commitment to planning (Nussbaum, 2012). She argues that planning includes team-wide planning, individual planning, and school wide planning (Nussbaum, 2012). Bringing a program like this to life requires a thoughtful and well-developed approach that includes these steps of planning. The school wide planning approach is multidisciplinary, and includes teachers, families, students, and even community members.

Finding a way to unite parents of hearing students and parents of DHH children alike is a definite challenge schools could face in implementing this program. However, with more education around the benefits, and fundraising for teacher training and resources, this support from all disciplines could be achieved. One thing that can unite parents, teachers, and communities alike is the quality of life for future generations. Ensuring every child has the tools they need to succeed should be a deeply uniting movement.

Additionally, creating a program requires a common philosophy statement that can unite these diverse groups and center the school's mission around a goal. This philosophy requires a science-based, accessible mission that students, teachers, and parents can understand. Instruction of ASL is simply not enough. To inspire full inclusivity, society must prioritize deaf culture and respect for diverse student populations. Knowing one's students is vital to creating a well-organized, and safe classroom environment. The individualized student plans should include specifics of Deaf culture instruction, as well as different accommodations students might need to have the best educational experience. Because plans to provide ongoing professional development, progress monitoring, and education for the family are so important (Nussbaum, 2012), implementing a program would require these elements. This also means understanding the background of the family and understanding the diversity of your students as deaf or hearing individuals. Sending a teacher newsletter home, fostering parent communication, and making the school mission easy to read and understand are all factors of implementation. Making these connections and creating relationships with families can bridge the gap between school and home and empower DHH students to find community with their family, as well as with their teachers and peers at school.

Additionally, the teacher implementation planning includes how time in the classroom will be split up between content and sign language, depending on the students' developmental levels. The teacher from Florida argues that within a preschool classroom, ASL can be taught in one part of the classroom while spoken English can be used in another section. Then, these stations can rotate so that every student gets the chance to experience every kind of instruction. Offering chances for students to connect outside of the classroom can also benefit their language acquisition. This can include social times like lunch, recess, read aloud times, games, and partner work (Nussbaum, 2012). By providing social time for students to talk outside the classroom, content can increase their vocabulary and social connections. Because of the success of this program, and the detailed explanations of how this school implemented these practices, creating a school wide, or even nation-wide ASL education curriculum is not far out of reach. Connecting language acquisition and content holds social, cognitive, and academic benefits for all students, both deaf and hearing.

It is true that “inclusion is not the destination; it is the journey. It is not a linear reform movement that was required by a public law, instead it is an incremental, multifaceted evolution process as school systems must adapt to the changing needs of learners” (Francisco et al., 2020, p.1). Inclusion is not simply a goal that educators, families, administrators, and policymakers are seeking to achieve. Instead, the process of refining the educational experience for DHH students is the principal element of inspiring inclusivity. If the journey to close these gaps and improve the current system for DHH children does not start with the core belief that every student deserves the right to a quality education, the journey will be for nothing. Believing that every student has the same undeniable claim to be in the same space (Scheulka, 2018), is the foundation for real inclusion.

Creating a program like this requires teachers to measure inclusion beyond the number of students with access, but instead the quality of the education, the real experiences of DHH students, and the outcomes they have within schools (Schuelka, 2018). If students are valued for the complex and multitalented young people they are, and given equal access to education, the potential for social emotional, cognitive, and academic benefits is endless. DHH students deserve to have a place they belong to. They deserve to be members of their classroom community who can actively participate in a meaningful way.

References

ABC News (n.d.). *Deaf and Proud to Use Sign Language*. ABC News. https://abcnews.go.com/Health/story?id=2719254&page=1

Addressing Teacher Shortages, Back to School, and Future of the Department of Education | NSTA. (n.d.). Www.nsta.org. https://www.nsta.org/blog/addressing-teacher-shortages-back-school-and-future-department-education#:~:text=According%20to%20the%20U.S.%20Department

Alumni, U. P. (2020, January 26). *Communication gap: Where accommodations for deaf children lack*. Urban Plains. Retrieved February 20, 2023, from https://urban-plains.com/deaf-in-a-hearing-world/

Bowen, S.K. (2008). Co-enrollment for students who are deaf or hard of hearing: friendship patterns and social interactions. *American Annals of the Deaf, 153*(3), 285–293. https://doi-org.dml.regis.edu/10.1353/aad.0.0052

Bowman-Smart, H., Gyngell, C., Morgan, A., & Savulescu, J. (2019). The moral case for sign language education. *Monash bioethics review, 37*(3-4), 94–110. https://doi.org/10.1007/s40592-019-00101-0

Cordano, R. J. (2022, September 27). *Why does inclusion often neglect the needs of deaf students?* Brookings. Retrieved February 20, 2023, from https://www.brookings.edu/blog/brown-center-chalkboard/2022/09/22/why-does-inclusion-often-neglect-the-needs-of-deaf-students/

Daniels, M. (2001). Sign language advantage. *Sign Language Studies, 2*(1), 5–19.

Deaf Center, N. (2023, January 3). *New Research from NDC: Closing the gap on #deafsuccess*. National Deaf Center. Retrieved February 20, 2023, from https://nationaldeafcenter.org/news-items/closing-the-gap/

Derrington, A. (2021, April 23). *Interview with aspiring deaf psychologist Danielle Guth*. Hearing like Me. https://www.hearinglikeme.com/interview-with-aspiring-deaf-psychologist-danielle-guth/

Dimarco, N. (2018). We need to make education more accessible to the deaf [Review of *We need to make education more accessible to the deaf*]. In T. Klagenfurt (Ed.), *TEDx*. https://www.ted.com/talks/nyle_dimarco_why_we_need_to_make_education_more_accessible_to_the_deaf?language=en

Employment, unemployment, and labor force rates deaf vs hearing U.S. 2017. (n.d.). Statista. https://www.statista.com/statistics/1095081/employment-unemployment-labor-force-rates-deaf-and-hearing-us/

Francisco, M. P. B., Hartman, M., & Wang, Y. (2020). Inclusion and special education. *Education Sciences*, *10*(9), 238. https://doi.org/10.3390/educsci10090238

Kelman CA, & Branco AU. (2004). Deaf children in regular classrooms: a sociocultural approach to a Brazilian experience. *American Annals of the Deaf*, *149*(3), 274–280. https://doi-org.dml.regis.edu/10.1353/aad.2004.0026

Kluwin TN. (1999). Coteaching deaf and hearing students: research on social integration. *American Annals of the Deaf, 144*(4), 339–344. https://doi-org.dml.regis.edu/10.1353/aad.2012.0337

Kubicek, E., & Quandt, L. C. (2021). A positive relationship between sign language comprehension and mental rotation abilities. *Journal of Deaf Studies and Deaf Education*, *26*(1), 1–12. https://doi.org/10.1093/deafed/enaa030

Kwon, E. Y., Cannon, J. E., Knight, V. F., Mercer, S. H., & Guardino, C. (2023). Effects of social stories on increasing social interaction and engagement of deaf and hard of hearing students with autism spectrum disorder in inclusive settings. *Journal of Autism and Developmental Disorders*, *53*(5), 1915–1929. https://doi-org.dml.regis.edu/10.1007/s10803-022-05430-4.

Lillo-Martin, D. C., Gale, E., & Chen Pichler, D. (2023). Family ASL: an early start to equitable education for deaf children. *Topics in Early Childhood Special Education*, *43*(2), 156–166. https://doi-org.dml.regis.edu/10.1177/02711214211031307.

Liu, A. (1995). Full inclusion and deaf education--redefining equality. *Journal of Law and Education*, *24*(2), 241–266.

Marks, Mishonne. “Linguistic Neglect of Deaf Children in the United States.” Ballard Brief. June 2020. www.ballardbrief.org.

Marschark, M., Bull, R., Sapere, P., Nordmann, E., Skene, W., Lukomski, J., & Lumsden, S. (2012). Do you see what I see? school perspectives of Deaf Children, hearing children and their parents☆. *European Journal of Special Needs Education*, *27*(4), 483–497. https://doi.org/10.1080/08856257.2012.719106.

Mayo Clinic Staff. (2022, January 12). *Friendships: Enrich your life and improve your health*. Mayo Clinic; Mayo Clinic. https://www.mayoclinic.org/healthy-lifestyle/adult-health/in-depth/friendships/art-20044860

McCain KG, & Antia SD. (2005). Academic and social status of hearing, deaf, and hard of hearing students participating in a co-enrolled classroom. *Communication Disorders Quarterly*, *27*(1), 20–63. https://doi-org.dml.regis.edu/10.1177/15257401050270010201

Miller, K. R. (2008). American sign language: Acceptance at the university level. *Language, Culture and Curriculum*, *21*(3), 226–234. https://doi.org/10.1080/07908310802385899.

Nussbaum, D. B., Scott, S., & Simms, L. E. (2012). The "why" and "how" of an ASL/English bimodal bilingual program. *New Directions in Deaf Education, v.13 p14-19.*

Paul, P. V. (2018). What is it like to be deaf? These strategies are used by people of marginalized identities in their personal lives and professional lives. *American Annals of the Deaf, 163*(4), 471–479.

Raimondo, B. (2013). It is the law! a review of the laws that provide Americans with access for all. *Odyssey: New Directions in Deaf Education*, *14*, 4–8.

Schwartz, M. A., Elder, B. C., Chhetri, M., & Preli, Z. (2022). Falling through the cracks: deaf new Americans and their unsupported educational needs. *Education Sciences*.

Studies from Lamar University Update Current Data on Education (Teachers' Beliefs and Practices Related to Writing Development of Asl/English Bilingual Deaf Students). (2022, December 9). *Health & Medicine Week.*

Tripod - a Brief History | TRIPOD. (n.d.). Www.rit.edu. https://www.rit.edu/ntid/radscc/tripod/about-tripod/tripod-brief-history

Visual Language and Visual Learning Science of Learning Center. (2012, June). ASL/English Bilingual Education (Research Brief No. 8). Washington, DC: Maribel Garate.

Visual Language and Visual Learning Science of Learning Center. (2016, April). Raising the Whole Child: Addressing Social-Emotional Development in Deaf Children. (Research Brief No. 11). Washington, DC: Linda Risser Lytle & Gina A. Oliva.

Wilbers, S. (1988). Why America needs deaf culture: cultural pluralism and the liberal arts tradition. *Sign Language Studies, 59,* 195–204.

Yiu, K. C., & Tang, G. (2014). *Social integration of deaf and hard-of-hearing students in a sign bilingual and co-enrollment environment*. Oxford University Press. https://doi-org.dml.regis.edu/10.1093/acprof:oso/9780199371815.003.0014

Young, A. (2018). Deaf children and their Families: sustainability, sign language, and equality. *American Annals of the Deaf, 163*