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Music From the Dark and Silence: Incorporating Deaf, Hard of Hearing, and Visually Impaired Students into the Music Education Classroom

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Introduction

Music, for thousands of years, has been used as a form of self-expression, or general form of expression. There are pieces for every single emotion such as Beethoven's Fifth Symphony, or Bach's Toccata and Fugue in D Minor. These pieces struck fear into our very souls as children when we heard the introductions. Beethoven's Fifth, is often used as a sign of terror in the first notes. Then, we get pieces on the opposite end of the spectrum such as Spring from Vivaldi's Four Seasons, or the playfulness that is Mozart's Clarinet Concerto in A Major. All of these works are beautiful and widely known. This is not a piece of literature dedicated to advocating to keep music in schools, but in fact is for another battle.

Deaf children are the last that you would expect to need or want to be involved in a music classroom, and from words that have been spoken in the past, what even is the point if they will not even hear the sound they are producing? Two major points can be discussed here: inclusion is a critical aspect in culture today, as there is legislation dedicated to preventing discrimination against those with physical disability/disabilities, and Deaf children deserve to have access to another form of self-expression just as those with hearing do. Another critical aspect to understand about this literature is this is not from an audist (an individual who believes they are better than others because they can hear) perspective. Hearing is not wished upon anyone nor would any Deaf individual who would not want to participate in a music education program be seen as inadequate for not wanting to participate. There is also a lack of inclusion in the music education classroom for those who are visually impaired. These students do not have access to the visual arts, and again, deserve access to another form of self-expression.

This project was inspired though by a friend who is Deaf-Blind (meaning they are both Deaf and Blind). After meeting this individual, and having some conversations, a spark for

research was ignited to learn about how to involve other Deaf-Blind individuals into a music education setting where their passion to learn music can be satisfied. Many of the things listed above may seem impossible to some. Some educators fear they may not have the proper accommodations for these students, but others think it is just too complicated. The concerns are typically, with visually impaired students, they will not be able to watch a conductor as they go through a section of music that increases and decreases in tempo. In reference to the works of R.L. Gregory, Alice Wexler perfectly tackles this ideology. "The visual cortex, which takes up half of the space of the cerebral cortex, is the biggest player in helping us to recognize and interpret what our retina sees. … there is no visual image of the object in our brain, only the pattern of neural activity." (Wexler). Meaning, the ability for an individual to learn music does not rely solely on vision itself, and accommodations can be made for these students to learn music.

Heading back in the direction of students who are Deaf or Hard of Hearing, the main obvious concern is, hearing. There is a very famed quote by George Veditz, a former president of the National Association for the Deaf that states, "…Deaf people are, 'First, last, and for all time, the people of the eye.'" (Holcomb). Music is a largely visual concept, with sheet music, conducting, and even music theory, which are visualizations of music on paper, with several rules about how certain notes, chords, and lines of music fit together. This is how individuals, using the most famous example of Ludwig van Beethoven, are able to compose and produce wonderful works of music. How do these students begin to get involved?

Legislation on Special Education and Those With Disabilities

There are several legislation on inclusion of those who have disabilities into schools and society. These legislations started in 1973 with Section 504 of The Rehabilitation Act, followed shortly by the Education for All Handicapped Children Act in 1975, which is now known as the Individuals with Disabilities Education Act. The most well known of all of these laws is the Americans with Disabilities Act that was passed in 1990. The No Child Left Behind Act of 2004 will not be included in the discussion on legislature, due to the controversy in special education behind the execution of this particular Act.

The main points of Section 504 are: students with disabilities should be educated alongside their peers as often as possible, students must have documentation of their disability, the beginning of a free and appropriate public education, parent notification if students are identified as disabled, and if the parent objects to the identification, they have the right to an impartial hearing. The hearing occurs if the parent or guardian does not agree with the placement or identification of the child as an individual with disabilities.

The Education for All Handicapped Children Act (EHA) eventually turned into the Individuals with Disabilities Education Act (IDEA). The Education for All Handicapped Children Act included two very important points within Special Education: Least Restrictive environment (LRE) and a Free Appropriate Public Education (FAPE). IDEA focuses heavily on having Individual Education Programs (IEPs), covering children ages 3-21 in Part B, and children ages birth-21 in Part C, gives state funding to programs for students with special needs, parents receive a written notice if their student is identified with a disability, and a hearing if the parent disagrees with their child's placement. Another advantage of IDEA is that it defines the disability, and how it affects the education of the student. As an example, many students have

glasses, which means they have a visual impairment. Though, most of these students can put on glasses and no longer have a visual impairment, meaning that this does not affect their education. A student is only identified as having a disability under IDEA if said disability, "...adversely affects a child's education." ("Sec. 300.8 Child with a Disability").

There are five titles in the Americans with Disabilities Act (ADA) and are as follows: Employment, State and Local Government Activities, Public Transportation, Public Accommodations, and Telecommunications Relay Services. Reasonable accommodations are also supposed to be made in an effort to include all individuals with disabilities, whether this includes a ramp to get from one location to another, but even accommodation in education as well. ADA also discusses how to properly file a complaint about locations or other individuals not complying to accessibility laws.

Several disabilities are covered under IDEA's legislation. Those disabilities are: Specific Learning Disabilities (Dyslexia, dyscalculia, dysgraphia, etc.), Other Health Impairment (ADHD, Hemophilia, etc.), Autism Spectrum Disorder, Emotional Disturbance, Speech or Language Impairment, Visual Impairment including Blindness, Deafness, Hearing Impairment, Deaf-Blindness, Orthopedic Impairment, Intellectual Disability, Traumatic Brain Injury, and Multiple Disabilities. Multiple Disabilities covers if a student has multiple other disabilities listed that does not include Deaf-Blindness. As an example, if you were to have a Deaf student that was in an accident and was diagnosed with a Traumatic Brain Injury, the student would need to receive services and accommodations for both Deafness and having a Traumatic Brain Injury.

Universal Design for Learning with Thoughts of Accommodation

In the classroom, there are several different variances that can be made for students with all disabilities that are listed under IDEA. One of the most well known accommodations for students with special needs is Universal Design for Learning, or UDL. According to Amanda Morrin, UDL is defined as, "...a way of teaching and learning that helps give all students an equal opportunity to succeed. This approach offers flexibility in the ways students access material, engage with it and show what they know." Universal design for learning is accessible to all students, which is why the word of universal comes first.

When determining what accommodations are necessary, you need to look at the definition of the specific disability to determine what accommodations and/or modifications would be best for these students. It is important to reiterate, in all definitions that these are only covered under IDEA if they "adversely affect a child's educational performance."

Definitions of Deafness, Visual Impairment, Hearing Impairment, and Deaf-Blindness According to IDEA

Deafness in IDEA is described as, "...a hearing impairment that is so severe that the child is impaired in processing linguistic information through hearing, with or without amplification, that adversely affects a child's educational performance." Visual impairment is defined as, "...including blindness means an impairment in vision that, even with correction, adversely affects a child's educational performance. The term includes both partial sight and blindness." There is also another definition for hearing impairment, which in IDEA is, "Hearing impairment means an impairment in hearing, whether permanent or fluctuating, that adversely affects a child's educational performance, but that is not included under the definition of deafness in this

section.” Finally, one more definition to look at is that for Deaf-Blindness, as that is not included under the definition for Visual Impairment or Deafness. “Deaf-blindness means concomitant hearing and visual impairments, the combination of which causes such severe communication and other developmental and educational needs that they cannot be accommodated in special education programs solely for children with deafness or children with blindness.” Now that the disabilities this literature is focused on have been discussed, accommodations can be planned for.

Accommodations Proven Successful for Deaf and Hard of Hearing Students

There are several accommodations that can be made for these students that have sensory disabilities. The first accommodation for Deaf students (Deaf people identify as Deaf, which is why people first language is not used here. “D”eaf and “d”eaf are two different ideas. “D”eaf referring to those who culturally identify as Deaf and “d”eaf referring to the medical condition of being deaf) we think of is Sign Languages. In America, we use American Sign Language, though Sign Languages vary from country to country. Another method that has been proven successful is DeafSpace Architecture. Gallaudet University, the nation and world’s only liberal arts school for Deaf and Hard of Hearing students, began collaborating in 2005 with architect Hansel Bauman to begin the DeafSpace project. Bauman helped develop the DeafSpace Guidelines, which help determine how to make more spaces Deaf Friendly. There are, “...five major touch points between deaf experiences and the built environment: space and proximity, sensory reach, mobility and proximity, light and color, and finally acoustics.” (“DeafSpace”)

It is important to elaborate on each point as they may not make sense to those who can hear, as deaf people have heightened visual awareness. Sensory reach helps to foster a viewpoint of 360 degrees, which facilitates better communication between signing individuals. Space and

Proximity helps foster a signing space, meaning that someone watching someone signing can see all facial expressions, and also full dimensions of signs. Mobility and proximity suggest ideas such as rounded corners to allow seeing hazards coming around corners such as other people while still being able to keep focus on the conversation. In light and color, we see how important it is for students who are deaf and hard of hearing to have environments where the light is not flickering, the walls do not have shadow patterns that cause disruption, as well as proper backlighting. Finally, hearing is a spectrum that ranges from mild to profound (mild being hearing sounds 20 dB or above and profound being hearing sounds that are 90 dB or above). Acoustics are a large part in DeafSpace architecture, especially for those who rely on residual hearing (any leftover hearing) to use. It is incredibly important to allow individuals who have the ability to rely on residual hearing to use it.

Language Deprivation: What it is and Its Consequences

Language Deprivation is a very serious issue among deaf students. Many deaf students do not get access to language until they enter school, or get meaningful conversation. This can result in many consequences. One of the most common consequences of language deprivation at home is the lack of a relationship between the family, but that is one of the least severe of the consequences of language deprivation.

According to the Journal of Deaf Studies and Deaf Education, and explicitly stated in the title, “Auditory Deprivation Does Not Impair Executive Function, But Language Deprivation Might:...” All students who are deaf or hard of hearing have had some sort of auditory deprivation in their life, simply because they cannot hear. Often, many people who are new to the world of individuals think that when a parent is made aware that their child is deaf or hard of

hearing, they automatically learn, in the United States, American Sign Language to communicate effectively with their child. This is similar to when we automatically assume that someone from China speaks Mandarin, or other languages that are native to China. This is not the case.

This same article discusses how many children who are exposed to language deprivation, are also at risk for executive function disorders. These include things such as emotions, impulses, and goal-directed behavior (Hall, M.). These behaviors are learned, meaning through watching and understanding, the child will learn how to perform the behaviors. In this article, there was an experiment conducted on how Executive Function (EF) compared to students who were deaf, deaf with cochlear implants (CI's), hard of hearing and peers who had typical hearing to see which students had better EF. Students who had CI's had higher T-Scores in the results and scored above the expected results. Further on in the article, a very rattling statistic is shared to give possible explanation as to why students who were deaf scored lower compared to their hearing peers. "Roughly, 95% of deaf children lack exposure to natural human language (spoken or signed) in their earliest months/years of life." (Hall, M.) Additionally, hereditary versus non-hereditary deafness is discussed, and if one has the privilege over the other.

Extended Effects of Language Deprivation

This article further clarifies that children with hereditary deafness have an advantage to children over children who have non-hereditary deafness. Children who have hereditary deafness have two advantages; first they have language introduced early in their lives and two, they get a sense of cultural identity that is not often found in those with non-hereditary deafness. In fact, 90% of deaf children are born to hearing parents. (Holcomb) Many individuals with deafness experience other abuses as well as language deprivation. According to the National Institute of

Health, 27.5% of deaf individuals experience emotional abuse, 21% experience physical abuse, and 20.8% experience sexual violence (out of a study of 308 deaf individuals). In another study of 236 deaf individuals, they were found to have a much lower quality of life and more emotional distress than those who were hearing. “Indeed some claim that the higher prevalence of traumatic and psychiatric symptoms in the deaf population are partially caused by inappropriate and/or incomplete medical and educational language interventions early in life, which create risk for subsequent language deprivation and behavioral health problems.” (Hall, W.)

In an interview from WBUR (Boston’s local NPR network) with Jen Foundas, written by Carrie Jung, there was discussion on what it is like to be told your child is deaf. Foundas has taken American Sign Language classes for five years at the time the article was written and is now proficient in the language. This article also states, “But for a variety of reasons- from access to resources to outdated medical advice- a majority of parents don’t follow Foundas’ same path. They either don’t learn sign language at all, or they don’t know enough ASL to sign to their kids in a meaningful way.” (Jung) Patrick Rosenburg is a researcher with the Language Acquisition and Visual Attention lab at Boston University. Rosenburg added that, “Language deprivation can have an impact on memory development, on cognitive development, brain developments, and cognitive capacity that can make it harder for the child to retain [and] to understand things like mathematical representation and literacy.” (Jung).

Assistive Technologies for Deaf and Hard of Hearing Individuals

Cochlear Implants (CI) have several different small portions to make up the larger function of the implant. These are, “...a microphone, which picks up sound from the

environment. A speech processor, which selects and arranges the sounds picked up by the microphone. A transmitter and receiver/stimulator, which receive signals from the speech processor and convert them into electric impulses. An electrode array, which is a group of electrodes that collects the impulses from the stimulator and sends them to different regions of the auditory nerve." ("Cochlear Implants")

Cochlear implants are very different from hearing aids. Hearing aids amplify sounds that can be detected by "damaged ears." ("Cochlear Implants") CI's on the other hand, "...bypass damaged portions of the ear and directly stimulate the auditory nerve." ("Cochlear Implants") An individual must be eligible for a CI, and not all deaf individuals are eligible for one. For example, if an individual does not have a cochlea, they are not eligible for an implant because they do not have a cochlea to attach the electrode to. Cochlear sound is not the same as natural sound that hearing people who do not have cochlear implants hear. Many individuals often describe it as a harsh metallic sound.

Deaf individuals may have vibrating alarm clocks under their mattress, lights on fire alarms, lights on doorbells, and some individuals can get trained hearing dogs for assistance in the home. Hearing dogs can be trained to perform a variety of tasks to assist individuals.

How Music Education Can Support Deaf Students

For some, it may be difficult to understand the concept of how students who are deaf could learn music. There are psychological hypotheses that claim musical training can help with encoding speech in the brain. One in specific is written by Aniruddh D. Patel, who is from the Department of Theoretical Neurology at The Neurosciences Institute in San Diego, California.

This theory is called OPERA, which stands for overlap, precision, emotion, repetition, and attention. OPERA is theorized to work because of plasticity in the brainstem. (Patel)

Learning speech can be difficult for these students due to the closeness of pitch, timbre, and cadencing of voice. An individual could get used to a close peer's voice, but have to relearn when they come in contact with another individual's voice. For these reasons, music education in both performance and theory would be beneficial to students who have residual hearing or those who have cochlear implants as a method of further training the ear to differentiate between pitches and articulations. Music, referring back to the OPERA theory, would be an excellent opportunity to assist students in learning how to use cochlear implants, if they have one, to understand speech.

Other Types of Blindness and Visual Impairment

There are several different forms of visual impairments which include: Nearsightedness (myopia), Farsightedness (hyperopia), Lazy Eye (amblyopia), Cataracts, Glaucoma, Retinopathy of Prematurity (ROP), Retinitis Pigmentosa, Coloboma, Optic Nerve Hypoplasia, Cortical Visual Impairment (CVI), and Stargardt Disease. ("Center for Music Learning") Also, there are varying levels of visual impairment which are as follows: partially sighted, low vision, legally blind, and totally blind. ("Center for Music Learning")

Literacy Rates in Blind Students

Before, involving these students in music is discussed, some literacy statistics among visually impaired students must be shared. Around 90% of Blind children in the United States, according to the National Federation for the Blind, are not exposed to or have Braille literacy

skills. Lack of literacy skills often leads to unemployment, and with that being said, 70% of the Blind population in the United States is unemployed and 50% of Blind students drop out of high school. (National Federation for the Blind)

In 2003, there were about 6,700 full time teachers of the Blind that are also qualified to teach braille and 93,600 Blind students that needed to be taught. One of the gray areas in Blind Education is that there is no specific definition of what it means to be qualified to teach braille. In 2015, it was expected that all 50 states were to enact legislation requiring teachers of the Blind to both obtain and maintain the National Certification in Literary Braille. (National Federation for the Blind).

To begin with the effort of teaching Blind students music related topics in Braille, there needs to be advocacy in the effort to teach students Braille and to get more teachers certified in Braille literacy. There is a true crisis of not having literacy among blind students.

Misconceptions of Individuals with Sensory Disabilities

There are many misconceptions about the abilities of blind individuals and many technological advances have been made in order to expand the horizons of independence. Some of these technologies include: long white canes, talking watches/clocks, print and braille writing aids, magnifiers, medical devices, household and kitchen tools, and NFB literature and multimedia. (Independence Market) With all of these technologies combined, many blind individuals can have extremely independent lives.

Assistive Technologies for Those Who are Blind/Visually Impaired

Technologies are the key to independence for individuals with sensory disabilities. Some other technologies for those who are blind are Braille note devices. These devices can pair to computers and several other devices to maintain accessibility. Other devices that are helpful are slates where students can punch their own notes.

Fears of Multiple Sensory Disabilities

Many individuals though, are scared to lose more than one sensory disability. As an example, there were a set of twin brothers in Belgium in 2012 who had been diagnosed with glaucoma, a disease that can cause blindness due to high pressure behind the eye. Both of them, devastated, mutually agreed to be euthanized as they were concerned about communication and quality of life after becoming blind as well as being deaf. Medical euthaniasia is legal in Belgium, and it is deeply saddening that they felt they needed to take these steps to begin with, but there are many successful people in the world who have sensory disabilities.

Successful Individuals with Sensory Disabilities

One of the most well known Deaf Blind individuals is Hellen Keller, though, her tutor was more widely recognized as someone who was able to teach a Deaf Blind individual. More recently, Haben Girma has made headlines as the first deafblind individual to graduate from Harvard Law School in 2013. In fact, there are several individuals that have sensory disabilities that have been incredibly successful. Nyle DiMarco became a household name after his wins on both seasons 22 of *Dancing with the Stars* and *America's Next Top Model*. Stephen Colbert, who is well known for being the host on *The Late Show* is also completely deaf in one of his ears.

Ludwig van Beethoven was a well known composer in the nineteenth century who, eventually, lost all of his hearing due to physical abuse from his father as a child. Though, he went on to compose one of the most well known pieces of classical music of all time, *Ode to Joy*.

There are plenty of other famed individuals who were deaf or blind that have made an impact. Stevie Wonder who is adored by many for being a blind piano player, and opened up the idea that individuals with disabilities could be successful. Another blind individual that is helping make a difference in the world is Juna Gjata. Also a Harvard graduate, Gjata does a weekly podcast titled *Food We Need to Talk* that helps people learn how to live healthy lifestyles.

It is important to share examples of individuals who are successful due to the fact that many people believe that individuals with sensory disabilities cannot be successful or independent. As discussed further above in this text there are technologies that allow these individuals to be successful, but that does not mean that individuals can not be successful if they do not have the technology. The key to being successful for any deaf, hard of hearing, or visually impaired individual is not one set protocol, and varies per individual.

Arguments Against Individuals with Disabilities Being Excluded from General Education Classrooms and Activities

There are arguments in special education, that having separate classrooms, or not allowing students to participate in activities due to disability could be regarded as dangerously close to "Separate but Equal." The legislation for Separate but Equal occured from the court case of Plessy vs. Ferguson in 1896. Although this legislation was originally for race after the Civil War, many think that it should apply to individuals with disabilities as well. Now, many are well

aware that separate but equal is not legal after the court case of Brown vs. The Board of Education. On the other hand, in some cases, individuals with disabilities are in separate classrooms and facilities. This is not to claim that having students in different classrooms is unconstitutional, but, to raise awareness as to where some potential arguments could come from to allow students in general education classrooms . (*Separate but Equal - Separate Is Not Equal)*

Other arguments for students not being included in general education classrooms or in extracurricular activities is because there are other skills that students with disabilities must focus that general education students may not need to focus on. Those are things such as independence skills, extra assistance if struggling in a subject, or learning how to use adaptive technologies. This was further clarified in an article published by Jane Erin, “Many professionals in the field of visual impairment maintain a cautious distance from the role of music instruction for their students. Often there is not enough time to include sufficient music instruction due to the importance of academics in a student’s daily schedule.” (Erin)

Although, there are schools for the blind that do have music programs. Edward Kahler, Jeremy Coleman, and Della Molloy-Daughtery were able to send out surveys and analyze music education programs at these schools. This is what was seen from those surveys.Thirty-seven surveys were sent, and out of those twenty-nine educators responded. “The most commonly reported music-related duty was conducting an ensemble (84%), followed by teaching elementary general music classes, and organizing and directing music programs (81%) each. A large number of survey respondents (71%) reported that their music related duties included teaching private lessons, teaching music classes to students with severe or multiple disabilities (69%), teaching lessons in braille music reading and writing (69%), and teaching lessons in print music reading and writing (69%).” (Kahler, Coleman, Molloy-Daughtery).

How to Include Students who are Deaf, Hard of Hearing, and Visually Impaired Students into the Music Education Classroom

There are several reasonings that can become doubts as to why these students cannot be involved in music education. It would be best to address each of them grouped by sensory disability, and explain how accommodations would work. The accommodations being discussed would be at what is called a mainstream school, or a school that is not a residential school.

The main concerns with Deaf students is keeping up with a band director from conducting, to talking normally, to give feedback on how pieces were rehearsed. One of the main methods that Deaf students have is the use of an Interpreter. Typically, these interpreters follow students from class to class and stand or sit next to the teacher. A common misconception of these educational interpreters is that they provide curriculum. Educational Interpreters do not provide curriculum, they provide assistance and support by relaying information from the instructor to the student. In this case, an interpreter would be of great use to stand behind the director and relay messages.

Some students with cochlear implants or who are hard of hearing, may not know sign language at all, or may not want to have an interpreter with them. When bringing peers into the mix, some students may not like the stigma of having an interpreter with them constantly. In this case, voice to text technology would be a best bet. In a classroom project done by Victoria Bricker, we were able to see how an app on an iPad made all of the difference for her student. This student was able to keep up with high paced honors class with the app “SoundNote.” This app allowed Zane to record his lectures and take notes simultaneously. As background knowledge, Zane was born hearing, but at the age of 2 contracted meningitis, causing him to

become deaf. Soon after, Zane received a cochlear implant, and with that implant has a 40 decibel(dB) loss. He had a 504 plan, but they were searching for alternate technologies. (Bricker)

These technologies would be helpful when directors add exaggerations and embellishments in a piece. These could be recorded and read, then afterwards added to the music to make sure that all of the music has all additions it should have. Another way that these could be done is what many hearing students do, and ask a peer next to them what was just said or added. Any app that has a recording capability, depending on the level of hearing that the student has, would be of great assistance. As an example, many band rooms have terrible echoes, which can make it very difficult for a student that has a hearing aid or other form of amplification, to make out what specifically is being said. In these cases, the recording could be close enough to the director that it could capture the sound without an echo. The student could relisten to the sound later to make sure every announcement or change that was made is caught.

Another concern with students who are Deaf or Hard of Hearing is that they will not be able to keep time or stay in time with the rest of the ensemble. In fact, “In terms of specific musical abilities, deaf students are capable of maintaining steady beat sometimes better than hearing students.” (Hash) As mentioned above, George Veditz, a former president of the National Association for the Deaf, stated, “...Deaf people are first, last, and for all time, the people of the eye.” (Holcomb) Many hearing students who are in involved music education classes get distracted by the hearing sense and can often get ahead or behind in the music while playing. Other hearing students can get distracted by these and potentially could cause a huge rift mid-performance.

Directors may wonder how Deaf students are capable of knowing pitches of various instruments. Acoustics and how sound works plays a large factor in this. Evelyn Glennie is a

percussionist who lost all of her hearing by age 12 and eventually went on to attend the Royal Academy of Music in London, England. Originally, she was denied admission to the academy due to the fact that she was deaf and the academy did not know the future of a deaf musician. (Glennie) Evelyn studied in private lessons for several years, but her lessons instructor one day asked her how she heard, and she explained how she heard through more than just her ears, that she heard through her, "...my hands, through my arms, cheekbones, my scalp, my tummy, my chest, my legs and so on." (Glennie)

A very large part of teaching a deaf student music is learning to allow them to listen in ways that suit them best. Maybe a student works best feeling vibrations through the floor. Evelyn Glennie demonstrates this same principle in her TED talk titled "How to Truly Listen," as she does not wear shoes as she plays her snare drum as well as the marimba. Glennie advocates especially for general music education and lessons the lack of using study books. Exploration on a student's own of an instrument could be the most beneficial way to learn for a deaf or hard of hearing student.

Another piece of technology that may be helpful are apps that you can upload and edit photos. A student could, if they wanted, take a photo of their music and upload it to an app where they could make edits to it and add additional markings where they are deemed fit to put. This could be done while simultaneously looking at the transcript of the speech from the day, or by potentially listening to it again to make sure that the markings were labeled correctly.

Deaf Space Architecture would also play a large role in this. Making sure that there are proper acoustics in the room for a band director is very important. This is even more important than normal when you have students relying on residual hearing. Having proper sound absorbing material is important for the student to be able to hear discussion that is going on in the

classroom as well as knowing the accuracy and authenticity of a sound they are supposed to be hearing. It also is important to make sure that there is enough room for them to see clearly if there is an interpreter. This could mean having stands that are lower, or can be wired that have gaps in them so the student can see through the stand.

All of the above aspects combined are very critical for students who are deaf or hard of hearing, but students who have visual impairments require different modifications. Much of the concern for blind students is again, the lack of the ability to see. Again, unpacking misconceptions is a good way to start talking about accommodations needed for each student.

Many directors wonder how blind students could learn music if they cannot see the print on the page. There is a Brailling system specifically for music. This involves the same 8 dots that Braille already has, but they are broken down for the notes A, B, C, D, E, F, and G. It also has certain dots for the octave that the note is played in as well as the duration of the note whether that be a hemidemisemiquaver (64th note) to a whole note. This brailling system does require partners though, as another student may need to read the music to the blind student so they may braille it themselves with their slate. Music in fact can be purchased in Braille. There is a website titled Braille Sheet Music where not only can you search for music by level of difficulty, instrument, composer, and genre, an individual can also upload their own to add it to the collection as well as request musical literature.

Another accommodation for students who are blind is an earpiece metronome, or a headphone that has tapped the beat of the piece to keep tempo with the rest of the ensemble. Another option that could be used to allow a blind student to keep time would be to have another student sit next to the blind student and tap time onto their leg. These may not be the most convenient for a music educator, but they certainly would assist in the concern of making sure

that tempos are accurate each time. This would also ensure the conductor would not have to worry about producing the same tempos every time they conducted.

Many directors become curious with Braille music and how the students follow along. These students would have to memorize music. Directors may find this to be a daunting task or a lot to ask of some individuals, but music memorization occurs quite often in the music education setting. Whether that be from an awkward page flip where you need to memorize a few bars of the next page, or from being in a marching band and memorizing various movements, warmups and exercises. Many individuals are very much so capable of memorizing sheet music.

Others may wonder how to even begin with teaching visually impaired students music. In the study previously mentioned by Kahler, Coleman, and Molloy-Daughtery, these were the most common methods that were used by music educators to assist in teaching their visually impaired students. "…rote learning, using professional recordings, using enlarged music notation, singing notes by phrases, improvisation or composition, instrument adaptation, recording the students' individual parts, student developed strategies, and using braille music notation." (Kahler, Coleman, Molloy-Daughtery)

Many individuals can get caught up in the fact that visually impaired students are visually impaired, and that prevents them from getting past the idea that teaching these students would ever work. The brain though, does not process images, instead, "…there is no visual image of the object in our brain, only the pattern of neural activity." (Wexler)

When teaching a student who is visually impaired, deaf, or hard of hearing, it is of utmost importance to meet with that student regularly and to make sure the accommodations that you have made for the student are working to their benefit. This does mean that if a teacher is able, they need to be a part of the ARC (Admissions and Release Committee) meetings when

discussing and forming a student's IEP (Individual Education Plan). It, again, is critical that these students are met with on a regular basis, even if just for a quick chat, to make sure that accommodations are properly working, then if they are not, steps can be taken to modify what accommodations have been made.

It is important to remember that technology is always changing. Many of these accommodations listed in this section were reliant on technology. The beauty of this is that as technology changes, there is more of an opportunity to assist and accommodate those who need it. This does not apply only to those who are Deaf, Hard of Hearing, Blind, Visually Impaired, this also applies to the individual who is paraplegic, who has difficulty with mobility, or who also has a sibling or a loved one that needs assistance.

Where Did These Accommodations Come From?

These accommodations that were listed above came from studies that were first tried in general education classrooms that were modified to fit the needs of music education. These could also be manipulated to fit the needs of other “special” classes. As much as general education students rely on these courses as a bit of a break from the normal everyday routine of classes, it is just as important for deaf, hard of hearing, and visually impaired students as well. It can be known that these students are often veered away from taking these courses due to needing support in academics.

Technology is constantly changing, which means that accessibility is changing. In ten years, there may be better accommodations than there are now. Smartphones, tablets, and other devices can allow us to widen our horizons for accessibility. In the twenty-first century using technology in the classroom is almost constant.

Music Therapy and Other Benefits to Music

One emerging field that has been shown that music is a benefit to others is music therapy. Music therapy has been beneficial to individuals with autism (Alvin & Warwick), dementia, and other mental health struggles. Many individuals who are deaf, hard of hearing, or visually impaired do not have proper access to the environment around them. In an article about caring for deaf individuals in Psychological care, it was important for clinicians to understand how an inaccessible environment around Deaf individuals can affect the client's psychological health. (Sgroi & Sinclar)

One aspect of Music Therapy that has been proven to be helpful is group drumming. There are several themes in group drumming which were highlighted in a study by Perkins, Ascenso, Atkins, Fancourt, and Williamon, and those were: Features of the drumming, features of the group, and features of the learning. Each of those though, had sub themes. The sub themes of features of drumming were as follows: nonverbal communication, rhythmic, and physical. The sub themes of features of the group were: connecting, belonging, accepting, providing safety, caring, and socializing. Finally, the sub themes of features of learning were: Inclusive, no mistakes, freeing, embodied, and the role of a facilitator. (Perkins, Ascenso, Atkins, Fancourt, and Williamon)

Granted, there may not be the availability of no mistakes in an ensemble, all of these elements are present and would be an excellent way to be able to also give students access to having assistance with mental health.

Why Music Education?

As mentioned above, many of these students do not have proper access to decent means of communication. This could be due to the fact they did not acquire language in the proper language acquisition period, or they did not have family at home that spoke their same first language. Even if a student has a cochlear implant, if they learned a sign language first, then learned how to read and speak, English is their second language. Giving students music could give a chance for them to connect with peers in a way they have not before, or even their family.

If a student does not acquire language until later in life, they may not know the proper words or phrases to explain their emotion to a counselor, their peers, their family or a therapist. This concept is widely understood in art. One can see Pablo Picasso's blue period and understand he was going through a very serious bout of depression, but if a student were able to play Sheltering Sky composed by John Mackey, they would be able to convey their emotions in a whole different way. The piece conveys feelings of calling out in desperation, then climaxing to what feels a huge overwhelming response that is pure beauty and warmth.

Music education teaches lessons that apply to life outside of the classroom as well. It is very difficult for teachers of the blind and deaf to find time in curriculum for these students, but there are several benefits on all sides for involving deaf, hard of hearing, and visually impaired students into the music ed classroom.

Benefits to Involving Deaf, Hard of Hearing, and Visually Impaired for Students with Hearing and Typical Vision

There is one concept that is often overlooked, is the benefits of including students who are deaf, hard of hearing, or visually impaired is that of students who have hearing and vision learning more about students who have the sensory disabilities. Many students who are in general education classes get very little interaction with students who are deaf, hard of hearing, and visually impaired. There is a very ableist mindset due to a lack of understanding. Ableist meaning thinking an individual who has typical hearing, vision, movement, are better than individuals who are not, or they take severe pity.

Consistently being around individuals who have these sensory disabilities, or other disabilities as well, will help end stigmas of those with disabilities. Instead of being the deaf student in the class, they turn into a peer, a friend. It is very important for typical individuals to know atypical individuals for a few reasons, those are advocacy for those with disabilities and a greater understanding of those with disabilities.

The more that students who have special needs are given the chance to participate in general education curricular activities, the more these students will be able to gain confidence in themselves as well. Hopefully, this would create a domino effect that allows students with disabilities to elevate their self-concept and be able to exercise ways to stand up for themselves as well.

Grants

Using the technologies above mentioned in the section may be difficult for schools in rural areas that may not have the funding. The U.S. Department of Education offers a variety of grants through the Office of Special Education Programs (OSEP). These grants, depending on which one applied for, would potentially be used in the classroom to expand what a Free and Appropriate Public Education means and a Least Restrictive Environment for the student. ("Office of Special Education Programs Grant Opportunities and Funding.")

A music educator may also be able to look at their school district to see if there are any other grants that may be available through local organizations, donors, or the Board of Education.

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