

Supporting the Literacy Development of Students Who Are Deaf/Hard of Hearing in Inclusive Classrooms

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1

Students who are deaf/hard of hearing have a variety of backgrounds and needs. This article provides research-based tips and strategies to increase literacy outcomes for these students in mainstream classrooms.

The addition of a student who is deaf or hard of hearing (D/HH) presents both challenges and important opportunities for classroom teachers, especially in the areas of reading and writing instruction. Based on our experiences working with D/HH students across a range of education settings, we have identified two principles for supporting the unique language and literacy development of D/HH students in mainstream classrooms. Following these principles creates rich environments for language and literacy growth for all learners and is uniquely supportive of D/HH students. In this article, we provide information related to the language and literacy development of students who are D/HH. We then discuss how the two principles for instruction can be put into practice, with a set of practical considerations for each.

The Language Development of D/HH Students

D/HH students have a variety of language histories, learning needs, and communication preferences. Language histories can be understood along a continuum, from rich opportunities to develop multiple languages during early childhood to impoverished access to language that often delays learning. For example, some D/HH students learn American Sign Language (ASL) as their first language, and then learn written and/or spoken English as a second (or other) language at home or in school. Other D/HH students learn spoken English as their first language using residual or augmented hearing and have fully developed English as their first language when they arrive at school. Finally, despite augmentation (via hearing aids and/or cochlear implants), some stu-

dents still do not have sufficient access to spoken English to naturally acquire it as a first language and have not been exposed to ASL. These students may experience a language delay because they have not yet had enough access to any language to construct a foundation for communication and learning. Much of our learning, both inside and outside of school, is mediated by language, and this requires students to have a fully developed first language to experience success in school.

D/HH Students Who Use ASL

These three examples of potential language histories each have different implications for literacy development in school settings. For example, students with a strong foundation in ASL are capable of developing literacy at the same rate and levels of achievement as their hearing peers, especially when given access to the curriculum and language of the classroom (Mayberry & Locke, 2003). In this way, D/HH students are similar to English learners because they may be developing and working between multiple languages in the classroom (e.g., home language, language of instruction; García, Johnson, & Seltzer, 2017). Both populations benefit from the opportunity

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to develop both languages simultaneously through comparisons, translation, and explicit instruction in English (Cummins, 2006; Dostal & Wolbers, 2014, 2016; Wolbers, Graham, Dostal, & Bowers, 2014; see the section Principle 2: Make Content and Thinking Visible).

It is important to note that hearing children with deaf parents (often referred to as Children of Deaf Adults, or CODAs) may share this language history if they were primarily exposed to ASL at home and are learning or refining English as a second or other language in school (Lillo-Martin, de Quadros, Chen Pichler, & Fieldsteel, 2014). If you have a student whose language history includes first acquiring ASL, you might support them using strategies similar to those you would use for English learners in class (Koulidobrova, Kunze, & Dostal, 2016).

D/HH Students Who Use English

Depending on the success of augmentation and early intervention, students with hearing loss who use English at home may arrive in your classroom as clear and fluent communicators. However, they may still benefit from additional support with vocabulary and syntax, even though English is their first language, because they may not have had consistent or complete access to incidental language learning if their ability to hear at a distance or in noisy settings is compromised (Davidson, Lillo-Martin, & Pichler, 2013). This may mean that these students miss some incidental knowledge, vocabulary, or conventions of communication that might typically be learned from over-hearing adult and other conversations (Cole & Flexer, 2015; Easterbrooks & Estes, 2007; Eriks-Brophy et al., 2006). For example, a great deal of social behavior is learned incidentally through overhearing the conversations of others (Antia & Kreimeyer, 2015), and a wide range of vocabulary words are introduced and reinforced in settings where more than one person is talking at a time or when the student is far enough away from the speaker that he or she would not naturally overhear (Flexer, 2004).

Some vocabulary and background knowledge may also be misheard by students with hearing loss

(Flexer, 2004). For example, D/HH students sometimes have difficulty hearing the final sounds of words, so they may routinely miss plural markers (-s, -es), tenses, or even sounds that change meaning, such as hearing *how* instead of *house*. Therefore, students who learn English as a first language benefit from opportunities to engage in frequent

class discussions (see the section Principle 1: Optimize Access) and explicit vocabulary instruction to enhance their exposure and solidify their understanding of academic language (Berndsen & Luckner, 2015; Cole & Flexer, 2015; Easterbrooks & Estes, 2007; Eriks-Brophy et al., 2006).

D/HH Students Who Experience Language Delays or Deprivation

Students who have experienced a language delay likely need to catch up on exposure to rich vocabulary and complex concepts as they work to develop a language foundation

for communication and learning (Dostal & Wolbers, 2014, 2016). These students may have developed their own home signs or gesture systems as ways to communicate with close friends and family members, but simple communication systems, unlike languages, cannot provide a cognitive foundation with enough complexity to support learning and communication across settings (e.g., Wilbur & Petersen, 1998).

The first academic priority for students with a language delay is language development through supported exposure and explicit instruction. In some cases, a teacher of the deaf (TOD) or speech-language pathologist (SLP) may be assigned to provide individual pull-out instruction to support classroom learning (see Berndsen & Luckner, 2012, for a description of these positions). A TOD or SLP may also work to support the development of ASL or English so that students can access instruction in the classroom in English or via an ASL interpreter (Luckner & Pierce, 2013). The individual setting also allows students to both preview and review information presented in the classroom so that they can more fully participate in the

PAUSE AND PONDER

- What language and learning differences might exist among students who are deaf/hard of hearing, and how might these affect your instruction?
- How would having a student with hearing loss change the physical and social environment in your classroom?
- How would having an interpreter in your classroom affect your instruction?
- What modifications would ensure communication access for all students?

classroom conversations that use words and ideas that are relatively new to them (Cannon, Frederick, & Easterbrooks, 2010).

Two Principles

5 The three examples of language histories previously discussed present the major categories of possible experiences, but each D/HH student has a unique history that may blend or extend beyond the scenarios we have described. Given the diversity among D/HH students, we present two broad principles for instruction aimed at supporting literacy learning in mainstream settings and give specific considerations for putting each into practice.

Principle 1: Optimize Access

Traditional classroom instruction often relies on both auditory and visual modalities to convey new ideas and facilitate communication. Therefore, the first principle of effective classroom instruction for D/HH students is to optimize access to content and conversation. Teachers might use these five ideas to put this principle into practice:

1. Inquire about the student's language history and communication preferences. If the student is young, families and other professionals may need to be involved in this conversation so that you can plan to support language development and vocabulary acquisition accordingly.
2. Set a classroom expectation for having only one speaker at a time, with a brief pause between speakers. This expectation supports respectful forms of communication and discussion in general, but it is particularly helpful for D/HH students with a range of communication preferences.
 - Students who use hearing aids and/or cochlear implants rely on technology that may respond to multiple voices speaking simultaneously as if all the talk is background noise rather than amplifying one speaker over the others (Luckner & Friend, 2011).
 - Students who use an FM system to amplify sound may need FM equipment to be passed from one speaker to the next so that each speaker is amplified.
 - Students who use sign language interpreters benefit from one speaker at a time

because interpreters can only interpret for one speaker at a time (Luckner & Muir, 2001; Winston, 1994).

3. Repeat questions and comments verbatim when there is naturally overlapping or rapidly occurring classroom talk (Eriks-Brophy & Whittingham, 2013). This is helpful for all students because it allows them to follow quick or exciting conversation and have equal opportunities to contribute to it. Repeating the comment exactly as it was said, rather than rephrasing or simplifying, ensures that students have full access to the original message (via spoken English or in ASL through an interpreter). In addition, if students are reading lips or only hearing a certain percentage of what you're saying, repeating it a different way each time is likely to confuse, not clarify the meaning (Alegria, Charlier, & Mattys, 1999).
 - Some students may not yet have developed the awareness or the advocacy skills to ask for exactly what they need, so teachers (and others) can ask, "Would you like me to say it again?" "Would you like me to say it another way?" "Would you like me to show you?" This shows you are committed to clear communication as a joint accomplishment, and one in which you invite and honor students' input.
 - Create a nonverbal cue that allows students to ask for clarification without calling attention to themselves. Some students are uncomfortable stopping a class because they missed something or did not understand, so they have developed a cueing system with the teacher, such as holding a red pencil when they need clarification. This allows a teacher to decide whether to repeat or clarify for the group or to follow up with the student one-on-one to ensure that communication is clear without stopping the flow of conversation or drawing attention to the student.
4. Make sure you understand the purpose and function of accommodations or technology D/HH students may use and support other students as they learn this, too. Until a teacher can be certain that an individual D/HH student is a good self-advocate, it is important to have daily checks of the equipment performed by

a designated adult (Johnson, 2010). Although it is sophisticated, the equipment is also fallible, and it is of no use to the student if it is not working properly. Likewise, knowing the purpose behind an accommodation ensures that you can optimize its usefulness in the least restrictive way. For example, amplification systems may be set to highlight speech sounds over ambient noise or to pick up sound coming from a certain direction (e.g., the front of the room). In these cases, simply charging the battery and having the system on is not enough—you must also consider placement in the classroom and the student's placement relative to the system.

- Consider showing all students how to use the FM or other classroom amplification systems so that D/HH students can fully participate in small-group and partner work. This includes sharing how to handle and position the equipment to maximize usefulness and minimize distractions. For example, the student has a radius of 3–6 feet in which the amplification equipment works optimally, but the signal degrades from there. Proper use of the FM system allows the student to have auditory access to speakers outside that range. Students should attempt to place microphones close to those who are speaking, but they should be aware that extra background noise (e.g., rustling papers, tapping pencils, a nearby air conditioning unit) will also be amplified along with their voices. This might mean you change the position of a device multiple times during a lesson or that you designate place or setting for whole-group, small-group, and independent work to ensure clear communication.
5. Remember that the common IEP accommodation “preferential seating” is not just for whole-group instruction but also applies to small-group and independent work. If seating and settings are optimized for all different configurations used throughout a lesson, this supports access for the D/HH student and ensures that peers have access to the D/HH student's input (Berndsen & Luckner, 2012).
- Consider other sources of noise when choosing a preferred spot. For example, a position closer to the front of the room may also be

closer to a radiator or air conditioning unit that interferes with students' hearing or concentration (Johnson, 2010).

- Facing D/HH students while you talk, while talking normally (without exaggeration), allows them to match guesses about what you are saying based on mouth movements with auditory input. Because research has showed that even the most talented lip-readers can only infer about 30–60% of what English speakers are saying based on mouth shape (Alegria et al., 1999; Bannwart Dell'Aringa, Adachi, & Dell'Aringa, 2007; Martin, Clark, Seligman, & Tong, 1983), it is important that students are sitting in a locations with clear sight lines to the teacher and/or interpreter so that information from mouth shapes, facial expression, and signs can be used.

Increasing attention to patterns of classroom talk may be uniquely helpful for D/HH students, but it can also create stronger classroom communities in which everyone takes responsibility for ensuring that communication is clear and inclusive. The addition of an interpreter, a brief pause, or the repetition of student comments may occur because of a D/HH student, but it may in fact support all students by ensuring clear, consistent exposure to content and discussion and increasing students' opportunities to engage in classroom discussions. Similarly, facing students while speaking (rather than talking to the board or looking down at a page) may become a habit because of a D/HH student, but it may in fact enhance your view of the whole class and your awareness of student understanding and behavior in real time.

Finally, it is important to remember that without increased attention to patterns of classroom talk and spatial arrangements, the class as a whole cannot benefit from the input of their D/HH peer. Though a D/HH student might be able to preview and review class material they miss, no one can replace the opportunity for interaction and real-time feedback when students express their ideas, take risks, and engage with their peers. Likewise, hearing students can never replace the perspective of a D/HH student as a member of their community of readers and writers. In addition, D/HH students and others may find it easy to become distracted or disengaged if they are often unable to follow or contribute to noisy, overlapping classroom conversations.

The best way to welcome D/HH students and all students is to consider how your classroom's physical environment and norms for communication support accessible, respectful academic discourse. Though this is often an implicit goal for classroom teachers, the unique needs of D/HH students invites us to make it an explicit goal that can be accomplished by using the tips we have listed.

Principle 2: Make Content and Thinking Visible

D/HH students are not unlike their hearing peers when it comes to the need for high-success reading experiences, purposes for reading and writing, and engaging formats, topics, and audiences for their reading and writing. However, D/HH students may approach reading and writing tasks with relatively less background knowledge, vocabulary, or innate ideas of what “sounds right” when it comes to spelling, grammar, and word choice (Easterbrooks, 2008). Teachers might use these four ideas to put the principle of making content and thinking visible into practice:

1. Support visual cues for word learning. D/HH students benefit from approaches to word learning that link visual patterns to meaning and sounds rather than relying on sounds alone. Word study programs where students learn families of words by reading, writing, and sorting them ensure lots of exposure to the written representation of words and the opportunity to learn and apply patterns to solve unknown words.
2. Create visual representations for oral explanations. Depending on their level of hearing loss with amplification or implantation, D/HH students may not have full or easy access to the many oral explanations and definitions you provide throughout the day. Therefore, they may experience everyday classroom routines differently than their hearing peers. For example, if a class happens upon an unknown word while reading a text aloud, a teacher might be in the habit of just providing a quick oral aside to explain the word to avoid interrupting the flow of the read-aloud (Beck, McKeown, & Kucan, 2002). This might be sufficient for hearing native English speakers because they have 100% access to the teacher's voice and lots of background and experience with the language around the unknown word

(Biemiller & Boote, 2006; Kindle, 2009). A D/HH student may miss part of the aside and may have missed a few words or endings along the way. So, the brief oral explanation might interrupt the student's understanding even more than a longer pause to consider the unknown word.

- Instead of using a brief oral aside, you might keep a whiteboard or chart paper nearby during read-alouds so that you can briefly pause, write the word on the board or paper, and discuss its definition in context out loud (Easterbrooks, 2008). In this case, all students have access to multiple, multi-modal exposures to that word (spoken and written), which increases the possibility that they will remember and use that word in their oral or written expression. In other words, connecting the new word with an image, keyword, or written definition allows the information to be conveyed visually, which not only supports full access to word knowledge for D/HH students but also offers multiple forms of representation for all students (Kindle, 2009).
3. Construct written records of think-alouds. This same principle of making information visible also applies to making thinking visible. For example, when thinking aloud orally, you might jot your thinking on chart paper or on the board, even if you are not writing directly on the text. We say “jot” because creating a visual representation of thinking does not require full sentences. Some teachers may use a system of codes or symbols to indicate common moves (e.g., predicting, connecting, inferring) as well as abbreviations. Teachers do not need to script their thinking, but jotting a few indications—the equivalent of marginal notes—not only ensures that D/HH students have full access to the teacher's thinking but also makes the teacher's think-aloud visible for all students in a format that they can refer back to as long as it is displayed. When teachers' thinking is written and displayed, it serves as a model text for the writing students might do as they read and write responses independently. In our experience, when teachers make their thinking visible by creating these model written responses, the quality of written responses among all students rises because students not only know what they could

be thinking as readers when they read independently, they also see how they could write about that thinking by referring to the teacher model (e.g., Culham, 2014; Derewianka, 1991). In this way, a practice that might be initiated specifically for a D/HH student enriches opportunities for learning for all students.

4. Invest in extended conversation to enhance word knowledge. Teachers often remark that language development in general and vocabulary development in particular stand out as areas of need for D/HH students. This fits what we know about D/HH students' lack of access to direct and indirect oral communication. Consequently, an essential aspect of any reading program for a D/HH student is intentional language exposure (Himmele & Himmele, 2009). This requires a set of habits and routines that capitalize on natural opportunities to build language rather than saving language development for vocabulary quizzes, sentence editing, or word work.

- For example, a D/HH fifth grader was reading an article in which Pluto is referred to as a dwarf planet. He had heard the word *dwarf* before but thought it was an insult that meant “stupid.” Rather than just explaining that *dwarf* can also mean “small,” the teacher talked about dwarves in *Snow White*, dwarf maple trees outside the school, and how *dwarf* is used in this sense to mean “small” but can be used in other (related) ways. Providing students with meaningful explanations and definitions of unknown or multiple-meaning words before or during reading allows students to use more cognitive energy to develop higher order thinking skills such as inference and prediction. It also invests in their knowledge about specific words as well as their awareness of language in general—how some words carry multiple meanings, how these meanings are often related but vary by context, and so on. This sort of extended explanation only takes an additional moment but ensures repeated exposure to new vocabulary (before, during, and after reading), which supports more efficient acquisition for all students.

- Adults are often in the habit of what we call “drive-by definitions,” where new words are explained rapidly by simply providing a

synonym rather than a definition. For example, if a student asked, “What’s a dwarf planet?” an adult might answer, “It’s a small one.” This clarifies understanding for the moment by providing a synonym but is insufficient to support the integration of the word into a student’s working vocabulary because it is both inaccurate and incomplete. *Dwarf* is not exactly the same as *small* (inaccurate definition), and it can mean several other things in other contexts as well (incomplete definition). When it comes to words that are likely to be used frequently in text and talk by mature language users across contexts—what Beck et al. (2002) would call Tier 2 words—drive-by definitions are not enough. It only takes a few moments to extend a drive-by into a deliberate description: one that explains what the word is used to mean in this and other contexts.

- Semantic mapping is a useful way to visually capture multiple, meaningful connections to new words and word meanings (Duffy, 2009). These maps can serve as a growing record of the network of meanings students learn as they discuss new words. With semantic mapping, a student can be exposed to various forms of a word and build meaning with a visual graphic that helps him or her identify, understand, and recall words in text.

Taken together, these tips for making content and thinking visible invite teachers to consider the nuance of language use and the representation of ideas in ways that could benefit all learners. Though these tips may have always been present or possible, the presence of a D/HH student makes them ever more vital to a classroom community of readers and writers.

Conclusion

As a result of trends toward inclusion, more and more students who are D/HH are being fully included in mainstream classrooms across the United States. According to the Gallaudet Research Institute (2011), more than 75% of D/HH students are educated in a mainstream program, compared with 60 years ago, when approximately 20% of D/HH students were integrated in mainstream programs. The presence of a

TAKE ACTION!

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D/HH student is a valuable reminder to be thoughtful and intentional about classroom communication and to ensure that all learners have access to multiple pathways to the content and processes you want them to acquire as readers and writers. The unique language histories of D/HH students often requires them to be sensitive to language and other forms of communication in ways that enrich classroom communities and inform powerful literacies. However, physical, spatial, and social configurations of classrooms cannot be taken for granted when teachers are planning to include D/HH learners. In our own work within mainstream classrooms, we have seen changes inspired by one student create fertile conditions for learning for all students, and we know you will see the same with these two principles in mind.

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MORE TO EXPLORE

- Strategies to Support the Development of Literacy with Deaf and Hard of Hearing Students: <https://www.gallaudet.edu/clerc-center/info-to-go/literacy/strategies-to-support-literacy.html>
- Center on Literacy and Deafness: <http://clad.education.gsu.edu/>
- Strategic & Interactive Writing Instruction, a framework designed for D/HH students: <http://centerondeafness.utk.edu/strategic-interactive-writing-instruction/>
- Supporting Success for Children with Hearing Loss: <http://successforkidswithhearingloss.com/>
- Effect of Hearing Loss on Development: <http://www.readingrockets.org/article/effects-hearing-loss-development>
- Literacy in Deaf Education: <http://www.deafwebsites.com/education/literacy-deaf-education.html>