

An Essential Audio Ingredient in Today's Accessible Learning Environments



Today's learning environments have changed markedly from just a couple years ago, prior to the pandemic. Tech devices are comprehensively in both the student and teacher hands, but are they missing a key peripheral device that allows them to sync with the changed learning modalities?

Headsets and headphones might seem to be an optional and indistinct peripheral for learners, yet they are proving to be an increasingly non-optional and functionally differentiated item, the absence of which could be causing operational inaccessibility among learners.

Accessibility and Modality

Five levels of the audio conversation have emerged recently that concern accessibility. The Learning Counsel's 2021 national Digital Transition Survey¹ showed that only 30 percent of schools and districts have purchased audio enhancing technologies, 31 percent plan to purchase, 20 percent are considering audio technologies and 19 percent are not considering a purchase. This national disparity in relaying the audio portion of learning resources that need them means that high numbers of students lack accessibility. More concerning, though, is the range of disparities due to schools addressing audio enhancements simplistically. Whole-room audio, for example, helps reach the back of classrooms for lecture and discussion-style learning, but is ineffective for a huge portion of asynchronous learners and many special needs students.

1. **Focusing Attention.** A first level of concern is the capacity for headsets versus whole-room audio enhancement to focus attention. Single headsets provide a new modality to personalize learning that prior classrooms did not necessarily have. They create a new arena of focused attention, wherein individual students may be at different points in the curriculum resources or reviewing materials again to ensure their own understanding.

Focused attention may even be a concern for students in remote learning where, at home, they have as many or more distractions than a whole class of other students studying or broken into small groups with some studying and others actively discussing a topic or working on a project. Modality, in the new learning environments, is making headsets more essential because

"To hear is one thing, to listen is something beyond that."

-Tom Finn, CEO and Co-Employee
Owner of AVID Products



In this Brief

Learn to define the five levels of concern around accessibility and modality of audio enhancements and consider the challenges of the modern learning environment.

Review a scale of audio headset functional capacities to ensure accessibility.

learning environments are aiming more at personalizing learning to stay competitive and drive higher achievement.

2. **Lost Academic Meaning.** The second level of concern is academic achievement overall, since there are probably daily disconnects happening even during whole group lessons. For example, headsets may be necessary for instant translations for emergent bilingual learners. Students also now spend a lot of time in individual learning courseware, creative tools, or watching videos as part of assignments that may have audio user interface as part of the user experience indicating right or wrong answers, cues to next steps, and clock ticking sounds denoting time is running out to complete an assignment. When these clues are turned off with sound off on devices because no individual headsets are in use, essential meaning is lost and can handicap learning.

“People generally remember 10% of what they READ, 20% of what they HEAR, 30% of what they SEE, 50% of what they HEAR and SEE, 70% of what they SAY and 90% of what they SAY as they DO a thing. There is no doubt that technical devices have greater impact.”

– *Journal of Education and Practice*

3. **Testing Disparities.** Various tests rely on clear audio instructions so that students may demonstrate their listening skills in responses as well as clear recordings of a student’s voice while reading to identify and grade their work and Lexile level. A listening Lexile level is now tested in many states for all students. Challenges with audio occur when the student either had no headset, a poor-quality headset, or a variety of brands that cause varying experience and outcomes. This is a third level of concern.
 4. **Diagnostic Truth.** A fourth level of concern, especially for accessibility, has to do with emergent bilingual learners needing both enhanced audio and recording for assessments of fluency. Where these are merely stock microphones and speakers on computing devices, important aspects of articulations can be missed or fuzzy.
 5. **Function Inequality.** A fifth level of concern is that various brands of headsets and headphones have inconsistent functional capacities. Some feature high quality noise-canceling, for example. Some have more reliable wiring and durable connection. Still others have a better effectiveness at rendering sound quality.
- At this level of concern is a new sort of inaccessibility that spans gradients from a no-peripheral headset or headphone all the way up to various degrees of functionality that could make serious differences for students, depending on the learning environment.



The New Teaching & Learning Scene

Time & Space Flexibility. The dynamics of the changed learning scene include expectations of higher flexibility from parents and students in a school’s schedule and space use. Since the pandemic, a fluidity of attendance has been being demanded across America, pushing schools and teachers to have asynchronous digital avenues readily available for the next days of quarantine or absence. Indications are that this is a major shift that will not be going away. “Virtual Days” are already a regularly scheduled part of many districts in the Atlanta, Georgia and Denver, Colorado areas.

New Student Demonstration Proof Types. The complexities layered on for learning resources also include student demonstration proofs via podcast or video, the rise of eGaming including within core subject resources, numerous language and translation adaptations that can be real-time during live teaching, immersive virtual learning environments, digital testing, and comic-strip creation. No longer are students doing only flat digital proofs like written essays to show they learned concepts. Many teachers provide students the right to submit their proofs in various ways that they are comfortable with – and some of those will include audio. Various proofs also mean that a teacher may need the same sort of audio functionality for grading with headsets so as not to distract students who are in the same room doing individual learning.

Recovery from the McGurk Effect.^{2,3,4} In some areas, the use of masks on teachers in the past two years could have had a serious lowering effect on learning due to what is called the “McGurk effect,” a categorical change in auditory perception induced by incongruent visual speech, resulting in a single percept of hearing something other than what the voice is saying. Put another way, the McGurk effect is a perceptual phenomenon which happens when a person perceives that the movement of another individual’s lips do not match up with what that individual is saying; it is an illusion which occurs in the interaction between vision and hearing in the perception of speech. Recovering from this effect to provide equitable learning points definitively to the use of headsets, especially in instances where the teacher may prefer to continue wearing a mask.

Personalization Imperative. A last dimension is that nearly every school and teacher is attempting to individualize learning for every student to both improve outcomes and remain competitive at a time when student attrition to alternatives like homeschooling is at an all-time high. Remembering to include well-known research related to how students retain information points to personalized audio components.

Personal Audio Accessibility Values Scale



1. No Headphone

- Use of audio from a tablet/computer/speaker
- Limited ability to block distracting noise in an active classroom or a home setting from other family members, or a dog barking.
- Poor connection from single-direction audio output.
- Limits ability to concentrate on oral instruction or audio coming from speaker in front of class due to classroom chatter, an air conditioner, a classroom overhead audio speaker or bell interruptions.

Increasing Accessibility for All Students & All Learning Modalities



Headphone/Earphones

2. Good but Limited Utility

- Nonadjustable to fit various head sizes.
- Little noise reduction through loose-fitting ear pads over/on ear allowing ambient noise to enter ear.
- Limited durability due to lower-cost wire susceptible to fraying, tangling or splitting easily which may cause it to be inoperable and potentially dangerous. Susceptible to student abuse and breaking damage.
- Reduced sound quality due to inconsistent and smaller speaker size.

3. Better Utility

- Age appropriateness with an ability to adjust for smaller size heads.
- Durability due to flexible materials which have fewer breaking points. Chew-resistant cord thick enough to withstand fraying. Seamless body components are sturdy plastics.
- Cleansable and made from safe-certified plastic.
- Comfortable soft ear pads designed to rest on or over ear, padded headband, adjustable, light weight – all designed for use for longer time periods without irritation.
- Passive noise control since ear pads that fit snug against ear limit passive noise from entering ear and help student listening ability, greater focus, and eventual comprehension of audio material -books, stories, and instruction
- Sound quality is enhanced with better speakers for the listening experience.

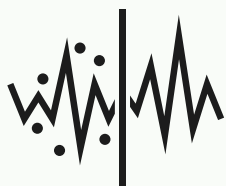


Headset

4. Best Utility

- Boom microphone with noise cancelling to provide clear voice recognition for speech-to-text or speech-to-record voice for ESL, ELA, or screening for various language fluency assessments.
- Noise reducing earpads/earcup which limit ambient noise from entering the ear, helping concentration and focus on audio content and instruction.
- Soft light-weight design which prevents irritation and the need to remove for longer periods of time.
- Larger speaker in ear pad which provides enhanced and immersive sound quality to engage students.
- Certified and tested products meet stringent safety standards measured including what material is used in product construction along with safe sound frequency levels.
- Durable – limited pinch points, no exposed screws, fewer breakage points, thick nylon cord.

Essential Features for Learning



Noise Cancellation: Speakers or microphone with this feature enhance learning focus. A quality microphone function

is essential to communicate clearly across digital devices, eGaming, speech recognition, screening and diagnostics, speech to text, to record students voice for screening and assessment or podcasting. Needs to have the capability to filter noise that does not associate with user's voice. Bi-directional noise cancelling mic will function this way. Needs to be reliable and produce consistent results. Needs to be sensitive enough to clearly pick up subtle sounds from one's voice.



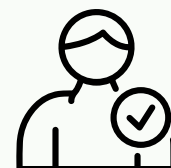
Universal Design – Maximizes the utility of a headset for multi-purpose use in various educational settings (screening, communication, assessment, podcasts, recording voice, eGaming, virtual, classroom)



Price/Value Ratio – needs to provide the greatest value at a price allowing more users to access headsets to support driving demand for (accessibility) 1:1 education



Safety – compliant to various certifications around product material and packaging, designed to withstand breaking, no sharp points, safe sound limiting technology for young learners, chew resistant chords, hygienic



Reliability and Consistent Outcomes – Critical to support high stakes assessments and screening students for learning gaps. Screening for dyslexia is completed annually with young learners.

The Future of Learning

Indications are that schools are already having to maneuver around a dissimilarity between young learner's propensity to engage better with "short form" versus "long form" content. Texting, Tik-Toking, and most mobile Apps that have captured the younger generation are short form. Short form texting even has its own condensed abbreviations and is highly informal.

The short form communication patterns of younger generations appear to be creating attention circuits in young minds that try to end-and-move-on from any one subject or source at tighter intervals than most traditional lessons have been built. Teachers complain of an inability to engage students for longer than these brief moments and find more success when they are interweaving a plethora of multi-sensory artifacts of learning. Causing long form attention discipline is the newest barrier, but one more easily overcome when lessons are multi-sensory involving both audio and visual stimuli.

There is also such a thing as "over-stimulation" by audio and visual use in teaching, particularly when other distractions are also evident, such as low volume on ancillary machines in the room, which itself points to the use of headsets to attain focused attention.⁵

MetaMetrics, the developer of the *Lexile Framework*[®] for Listening cites that Business recruiters list listening skills as second only to oral communication skills as the most important skill they look for in new hires. "Listening dominates our time spent communicating. Studies of corporate executives, college students and K-12 students all show that the majority of daily communication is spent in listening activities. More time is spent listening than reading, speaking or writing, with several studies showing that over twice as much time is spent listening than is spent communicating in any other mode. Listening is also a key component of academic success. Studies have shown that effective listeners are better students and are more likely to achieve overall academic success."⁶

While schools recover learning and sync to the current generation's patterns, understanding the effect of audio in the learning mix and the utilities of headsets is an essential move to help set an equitable stage for learning. ■

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