Key factors in deciding your classroom amplification devices (CAD) for all your students

BY MARKUS HILBERT, A.U.D., DOCTOR OF AUDIOLOGY

What is soundfield audio?

Soundfield audio, also known as classroom amplification devices (CAD), are systems that allow a talker’s voice to be broadcast from a microphone to a limited space through speakers to enable the listener to hear and understand speech better. Most microphone/speaker systems will accomplish this, but not all systems are created equally and will not work for every level of listener. The goal of a soundfield system should be to enhance the key speaker’s voice in the classroom for everyone.

The needs of the student

In educational settings there are key principles which should be considered when investing the district’s allocated funds for classroom amplification. Every students’ diverse hearing ability is a consideration that is sometimes overlooked at an alarming rate from an audiological perspective. Here are some key questions that should be asked:

1) Do the speakers provide the right sound for speech understanding at the higher volumes that our classes are subject to? Does the system change volume automatically to give the right sound at the right time, or does the instructor have to raise their voice causing long-term vocal strain?

2) Does the system help in the diverse hearing needs of the disadvantaged student and the early development child’s regular hearing needs at the same time? Does it offer hearing support for students with APD (auditory processing disorder), autism spectrum, UHL (unilateral hearing loss, one sided) and ADHD?

3) Does the system work directly with the student of the deaf and hard of hearing’s hardware? If not, does the system need to be patched to the students’ devices, resulting in reduced understanding and increased distortion?

4) Do the systems have interference from outside signals resulting in broken speech amplification that is detrimental to speech understanding in learning? Meaning the systems are not used and money is wasted?

5) Does the system contain all seven principles for Universal Design for Inclusion or Learning?

Through this article we look at the needs of the students to help them advance and learn through hearing and learning optimally, and what to consider when selecting a CAD system.

What are the diverse needs of each child

When looking for a system there are some key needs that should be addressed for each type of listening student:

- APD (auditory processing disorder). One in 20 students in your classrooms are affected by this, although it is sometimes misdiagnosed as ADHD. APD is a disassociation of what our ear hears and what signal is sent to the speech centre of our brain. A person with APD can manage in quiet atmospheres but is unable to process language in noise without assistance. These students are deemed regular hearing in the school system without auditory supports of any kind.

- ASD (autism spectrum disorder): One in 66 students in Canada have been diagnosed as a child with autism. A student with ASD is affected by auditory overstimulation. Loud noises
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and loud rooms create stress and can trigger outbursts or shutdowns due to overstimulation. Students with ASD can benefit from clear, direct, and focused audio instruction. These students are also deemed regular hearing by the school system without auditory supports of any kind.

- ADHD (attention deficit hyperactivity disorder). One in 20 of your students are affected by this disorder. Amplification at the right volume (the optimal signal-to-noise ratio) has been proven to assist in focusing students with ADHD.

- Deaf and hard of hearing: Another one in 20 of your students are affected by a form of medical hearing loss. Many are not diagnosed. Lower loss levels benefit from a perfect signal-to-noise ratio in a CAD system and high-loss students benefit from receivers in their hearing aids for the mic signal. Covered when diagnosed in B.C., the Provincial Resource Program – Auditory Outreach (PRP-AO) provides students with Roger X hearing aid receivers and a Roger SoundField Inpiro microphone that sends its signal directly to the receivers.

- Early speech development. All younger children benefit from clear, concise amplification in the classroom for speech development. By hearing articulate language through an amplification system, it benefits a child’s developing speech patterns and inflections. In verbal reading practices, students that are amplified through a mic/speaker system improve their verbal reading skills by up to 21 per cent on developmental reading assessments.

**Deciding what system to use**

This question has been affecting the education sector for many years. The question of price, the question of what was here before, and the question of what is best for the students are all valid questions when talking about purchasing CAD systems.

Discussing the choices, the guidelines have been put forward by academia already. Does the system follow the key principles of Universal Design for Learning and Inclusion (UDL/I)? Is the system designed for equitable use (equal/inclusive to all), flexibility in use (how it adjusts to its environment, other tech), simple and intuitive use, deliver perceptible information (communicates effectively the lesson verbally), have tolerance for error (designed to minimize errors), requires low physical effort in use, and made for size and space by approach and use? Between infrared, FM, dynamic FM and Roger Dynamic DM, purchasers have to consider the up-front cost, long-term costs, impact on student population, and more. The only system that will meet all UDL/I criteria and be less expensive long-term and benefit the most students, even those deemed to have normal hearing, is Roger Dynamic SoundField (DM).

Roger has proven to be the right choice over and over within the audiological world. This is why the Audiology Outreach Division of B.C.’s Provincial Resource Program uses Roger accessories. Most hearing aid brands that are involved with pediatric hearing solutions are designed to accept and utilize the Roger receiver in their hearing aids because it is the gold standard. With nominal cost differences between systems and greater longevity of the system, why choose to not use the best for direct hearing aid integration and that offers the easiest in verbal understanding for every level of listener for the rest of the classroom?

As a doctor of audiology, when considering the options available for CADs, Roger is simply the best pediatric solution for the classroom. It includes a 100 per cent UDL/I designation product (the only one), a clinically designed speaker for speech understanding by hearing industry experts, with seamless integration into personal systems, a signal so secure that Roger is even considered for a court system because it is so secure and never has interference (it’s digitally modulating all the time to find the clearest channel), significant expandability (up to 35
mics in a single room if needed), and self regulating volume levels based on background noise in the room, as it saves the teachers voice from over vocalization, the system does it for them and it gives the best signal-to-noise ratio at all times.

Markus Hilbert is a doctor of audiology with over 20 years of experience in private and public health care, academia, and several audiological initiatives. He lives in Kelowna with his wife and three daughters, and is passionate about his family, the outdoors, motorcycles, reading, and his profession. He advocates for best practices and innovative solutions to achieve optimal patient care outcomes for kids, adults, seniors and school, work and play. Email him at markus@soundfieldsolutions.ca.