AMERICAN SPEECH-LANGUAGE-HEARING ASSOCIATION

Acoustics in Educational Settings: Position Statement

ASHA Working Group on Classroom Acoustics

This position statement was developed by the American Speech-Language-Hearing Association's (ASHA's) Working Group on Classroom Acoustics. It was approved by ASHA's Legislative Council in 2004. Members of the Working Group on Classroom Acoustics include Karen A. Anderson, Susan Brannen (vice president for professional practices in audiology, 2001–2003), Carl C. Crandell, Peggy B. Nelson, Anne Seltz, Joseph Smaldino, and Evelyn J. Williams, (ex officio).

The American Speech-Language-Hearing Association (ASHA) recommends an appropriate acoustical environment for all students in educational settings. Therefore, ASHA endorses *ANSI S12.60-2002 Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools* (ANSI S12.60-2002) as the national standards for classroom acoustics. It is well recognized that the acoustical environment in a classroom or other educational environment is a critical variable in the academic, psychoeducational, and psychosocial development of children with normal hearing as well as children with hearing loss and / or other disabilities (e.g., auditory processing disorders, learning disabilities, attention deficit disorders). Inappropriate levels of reverberation and / or noise can deleteriously affect speech perception, reading / spelling ability, classroom behavior, attention, concentration, and educational achievement. In addition to compromising student function, poor classroom acoustics may also negatively affect teacher performance and increase vocal pathologies and absenteeism. Thus, all educational settings have an incentive to develop acoustical conditions that meet national standards. For children with hearing loss and / or other disabilities, the acoustics of the proposed educational setting(s) should be considered and addressed during the determination of a child's educational needs and placement.

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Acoustical factors in a classroom include: (1) the level of the background (ambient) noise in the room; (2) the relative intensity of the information carrying components of the speech signal to the non-information carrying signal or noise (i.e., signal-to-noise ratio [SNR]); and (3) the reverberant characteristics of the environment. To achieve appropriate acoustical conditions in an educational setting, ASHA recommends the following:

1. Unoccupied classroom noise levels must not exceed 35 dBA.
2. The signal-to-noise ratio (SNR) should be at least +15 dB at the child's ears.
3. Unoccupied classroom reverberation times must not surpass 0.6 seconds in smaller classrooms ($< 10{,}000$ ft^3) or 0.7 seconds in larger rooms ($\geq 10{,}000$ ft^3 and $\leq 20{,}000$ ft^3).

It is important to note that these acoustical criteria are essentially identical to the recently approved ANSI Standard on classroom acoustics. Additionally, ANSI S12.60-2002 provides acoustic guidelines for learning spaces greater than 20,000 ft^3.

It is imperative that all new construction adhere to the acoustical criteria indicated above and stipulated in ANSI S12.60-2002. The fundamental strategy for improving acoustics within existing classrooms is acoustical modification of that environment. Acoustical measurement and / or modifications of educational settings should be multidisciplinary in nature and conducted by trained qualified professionals, such as audiologists, architects, and acoustical engineers. It is important to realize that these acoustical criteria are considered minimal. Some students, for example those with hearing loss, may require further signal enhancement technology. For additional information on acoustical criteria and hearing assistive technology, see ASHA's *Acoustics in Educational Settings: Technical Report* and *Guidelines for Addressing Acoustics in Educational Settings.*