Much of children’s learning at school is through extended periods of hearing and listening. School children spend an average of four to five hours per day in classrooms. Acoustically-poor teaching spaces can make hearing and understanding of speech very difficult for children, and therefore, these spaces are inappropriate for learning situations. Due to their neurological immaturity and inexperience in predicting a message from its context, children are inefficient listeners. Children require optimal acoustic conditions if they are to hear and understand speech. Children who continually miss vital words, phrases and concepts in class become significantly disadvantaged. Communication between teachers and students is critical for learning. Therefore the environment must enhance clear communication.

**POOR ACOUSTIC DESIGN**

Spaces with poor acoustic design can result in inappropriate levels of background noise and reverberation times, which can negatively affect:
- Concentration
- Hearing
- Reading and spelling
- Behaviour
- Attention and
- Academic performance

Furthermore, children developing language skills in poor acoustic environments may develop long-term speech comprehension issues.

**AAAC**

The AAAC recommends the following qualities in teaching spaces and associated areas in education facilities:
- Appropriate background noise levels
- Reverberation times relevant to the room use and function
- Proper signal-to-noise ratios (S/N)
- Excellent speech intelligibility (including open plan areas)
- Minimum disturbance or distraction from nearby or adjacent activities, or external noise sources.
Research suggests that reverberation times of 0.4s or less in small and mid-sized classrooms, and 0.6s or less in larger classrooms, will not impact speech intelligibility excessively. For a typical talker in a classroom, the requirement for excellent speech clarity will be satisfied when the background noise is sufficiently low, that is around 35 dBA.

**CLASSROOM DESIGN CONSIDERATIONS**
- A spoken voice level should be at least 15dB above the background noise level throughout the room.
- Background noise levels should be 30-40dBA or less when unoccupied.
- Overall sound levels (consisting of teachers voice and student’s voice) should be no higher than 65-70dBA throughout the room.
- Sound absorbing materials should be placed to minimize reverberation to less than 0.4s in primary teaching spaces and 0.6s in secondary teaching spaces.

In the case of students with special hearing requirements: Rooms should be a Reverberation Time of 0.4 seconds or less. Signal to noise ratio should be no greater than 20dB.

**ACOUSTIC TREATMENTS FOR CLASSROOMS**
- Acoustic treatments need to be able to capture a reasonable percentage of sound frequencies; otherwise, a portion of the vocal sound frequencies will reverberate in the classroom. The reverberation will reduce speech intelligibility leading to a reduction in learning ability for the student.
- Each subject-specific room requires differing acoustic treatments so that the room is fit for purpose for the given activity.
- Places that have audio visual equipment and amplification systems need to have acoustic surfaces that enhance the amplified sound:
  - Music rooms
  - Gymnasiums
  - Theatres
  - Kindergarten rooms
  - Libraries
MUSIC ROOMS
- Place music rooms away from general classrooms.
- Allow for diffusive surfaces in performance spaces.
- Allow for absorptive surfaces for teaching spaces such as Calando Panels to the ceilings or walls can improve the acoustics in teaching spaces.

LECTURE THEATRES & MULTI-PURPOSE HALLS
- Seating should be upholstered.
- Moveable panels such as ECOSTrong or ECO Flex are self-supporting and light enough to be moved around to where you need them to be.
- Reverberation times should be 0.6 seconds.
- For large halls, reflective surfaces should be placed to the front and centre of the room.

CONTROL SPACE AND SOUND
Improving the acoustics in your classroom doesn’t have to be an overwhelming experience. The experts at Avenue Interior Systems are available to assist you with whatever commercial noise control needs you may have. For more information on how to improve acoustics in your classroom, contact Avenue Interior Systems on 1300 827 177.

ABOUT AVENUE INTERIOR SYSTEMS
Avenue Interior Systems takes noise treatment to the next level with our fulling customised, engineer-designed internal acoustic and soundproofing solutions. Avenue Interior Systems specialises in office, education, retail, public spaces, banks and medical acoustics. Our staff offer both on-site and remote assistance to ensure your acoustic design is perfect for you.