

Issue 3 - Acoustics in Education

People learn better when they can hear what is being taught. Teachers know this. They also know that when the room's acoustics are poor they have to raise their voices for extended periods, leading to health problems. Good acoustic design is critical for everyone in the education environment. And the courts are starting to agree...

Unfortunately, many schools have poor acoustics. The most serious problems are caused by a lack of sound insulation between classrooms, and excessively echoic rooms. These problems increase the strain on teachers' voices, as they have to use their voices for longer periods to be understood and raise their voices to maintain control.

International research shows that a disproportionate number of voice clinic patients are teachers (chronic sore throats, laryngitis, etc.). Most people know a teacher who has lost his or her voice. Sick leave and cover teachers are costly, both financially and educationally.

The bottom line is that a student's learning environment – and therefore a teacher's working environment – is compromised if the acoustic design is poor.

Intelligible speech

This is the most crucial aspect of the acoustic design for education facilities. A teacher must be able to talk to the class and be understood, without needing to raise his/her voice. Prof. Trevor Cox (President of the Institute of Acoustics) explains:

There is a substantial body of scientific evidence that poor acoustics are linked with impaired cognitive performance in children. Put simply, if pupils are unable to hear what they are being taught they are less likely to be able to learn. Pupils with Special Educational Needs are especially disadvantaged.

The modern open plan, group work teaching methods make this even more important.

The key factors controlling speech intelligibility in a classroom are its echoic nature (known as the

Reverberation Time or "RT") and the ambient noise level in the room.

To control the RT, install acoustically absorbent materials. It often isn't pretty, but a grid ceiling is usually the easiest and most cost effective method. If aesthetics are important or the design calls for exposed soffits, then wall panels, hanging baffles and acoustic rafts are good alternatives (just more expensive). Carpets help too!

To control the ambient noise, design the shell properly. The "shell" means the walls, ceiling, floor and glazing.

"If pupils are unable to hear ... they are less likely to be able to learn"

Reduce the traffic noise, the aircon noise and the hammering from the neighbouring woodwork class, and suddenly the teacher can talk normally again. Modern building materials often have lower acoustic

performances than traditional brickwork, so must be carefully designed.

Teacher health: it's your responsibility

Now the stick. The health issues related to poor acoustics in schools are well documented; so well in fact that courts are starting to award teachers compensation for workplace-induced injuries. In November last year, a UK court awarded a teacher the equivalent of R1.5m compensation for damage to her voice as a direct result of having to raise her voice while teaching.

The Occupational Health and Safety Act instructs all employers to provide a work environment that is safe and without risk to the health of the workers. It is your responsibility as designer that the building allows the employer to do just that.

SRL: Experts in education acoustics

At SRL, we have designed over 200 schools and 80 tertiary buildings, with classrooms, auditoria, music departments and recording studios. We have extensive experience in designing educational buildings for the 21st century teaching environment.

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