



# A sound investment

A classroom's acoustics are at least as important to teachers and pupils as the way it looks, writes *Michael Willoughby*



**L**ive surfaces, such as windows, tables and whiteboards cause sound waves to bounce back into the ear a few microseconds after the teacher's voice.

The science is complex, but bad sound environments knock both teacher health and pupil attainment.

The NUT reckons there's a problem if teachers need to raise their voice to be heard by someone two metres away or less. This is mentally and physically tiring.

But things can get worse for many. Studies showed 20% of teachers reported voice problems versus 3–4% of the average population<sup>1</sup>. These may include nodules, contact ulcers, haemorrhages, polyps and even lead to a tight, strangled voice. Such injuries rose from 9.8% to 18.2% among student teachers induction to graduation<sup>2</sup>.

But it's not just the voice at risk. Researchers at the Institute for Interdisciplinary School Research (IISR), Germany, measured the heart rate of the teacher working in the same room before and after acoustic treatment. They found her to be relaxed 60% and 80% of the time, respectively.

That 25% stress boost makes high blood pressure, heart disease, obesity and diabetes more likely and any of these diseases can lead to lost work days.

Kate Tomes is leader in modern foreign languages, Dover Grammar School for Boys. She says trying to teach in poor acoustics can make you: "Want to pull your hair out."

"Occasionally I've taught in a classroom where you can hear next door's

interactive lesson through the wall, distracting my train of thought and making work almost impossible."

Her experience is backed up by research, again from the IISR, which found 17% less material was covered in a noisy classroom. Pupil-centred teaching time halved – with noise levels an average of 13dB higher in an untreated room.

Not every music master is as lucky as Joss Sanders, director of music and head of creative arts at Bedford School, who teaches in a hall fitted with variable acoustic panels.

Reverberation here can be tailored to suit. He says schools which retrofit music halls without care and attention to sound can create "problematic" environments.

He continues: "Meanwhile, transference [from one room to another] has a huge impact on one-on-one learning. A classical guitarist being taught next to an un-insulated room in which someone is playing a trombone can be hugely distracted."

## THE BASICS OF GOOD ACOUSTIC DESIGN

If you are designing a new school or classroom, consider the shape of the room and its position in relation to any internal and external noise sources. New school-builders should also make provision for acoustic panelling in the budget, recognising it will pay for itself in happier staff, fewer sick days and better academic results.

Francesca Borghi, architectural assistant at Walters & Cohen, is working on a new

library wing for Reigate Grammar School (pictured, top).

She chose Topakustik panels, having specified them previously at St Swithun's School in Winchester.

The product features perforated board topped by another layer containing grooves, holes, squares or micro-holes, giving the impression of a solid surface. The result is a much better balance of absorption and reflection.

"The new hall we built for St Swithun's has excellent acoustics," says Borghi. "It's reassuring for a client when we can say with confidence that a product has been successful in a previous project."

For existing classrooms, Topakustik makes a range of affordable panels with EcoSUND absorber made from recycled PET bottles and plant fibre. Some can be fixed on as large or small an area of the wall or ceiling as needed with Velcro or other fixative methods. The project can be carried out easily by the school caretaker.

Piers Shepherd, Acoustic Product owner, will fit out one of your classrooms at cost so you can see what difference it makes. "I guarantee everyone will be fighting to teach in that room" he says.

**To make an appointment with Piers, call 01227 281140 or email [piers.shepherd@acoustic-products.co.uk](mailto:piers.shepherd@acoustic-products.co.uk)**

<sup>1</sup> Russell et al 1998. <sup>2</sup> Langridge et al 2004.