

Influence of acoustics in the classroom

In education, most knowledge is transferred by means of speech. Therefore it is essential that this speech can be heard properly. This infographic shows the influence of sound in a classroom.

Effects on the teacher

Good acoustics



Fit, energetic – even after work



Better performance



Less absenteeism through illness



Increased efficiency

Poor acoustics



Increased heart rate



Frustration and stress



Voice problems



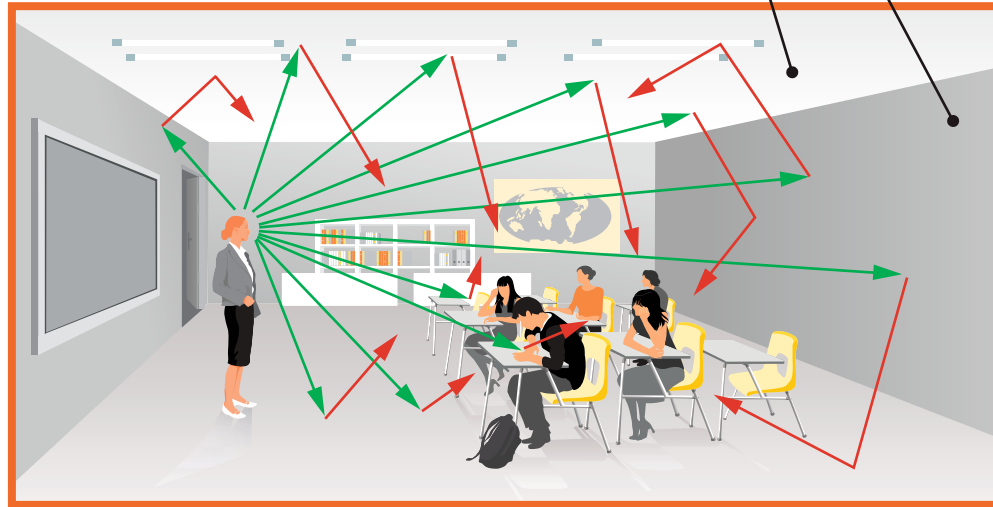
Tiredness



→ Positive sound
→ Irritating reflection

Poor acoustics

Hard ceilings and hard walls reflect sound



Effects on the student

Good acoustics



Concentration



Motivation



Calmer behaviour



Better performance

Poor acoustics



Hard to concentrate



Easily distracted



Tiredness



Reduced performance



Solution

Our hearing performs best outdoors, where do not suffer from resonance and irritating reflections.

However, these days we spend more than 90% of our time indoors in rooms with hard floors, walls, ceilings and a lot of glass.

For an optimised classroom we recommend a top-quality absorbing ceiling combined with absorbing wall panels.

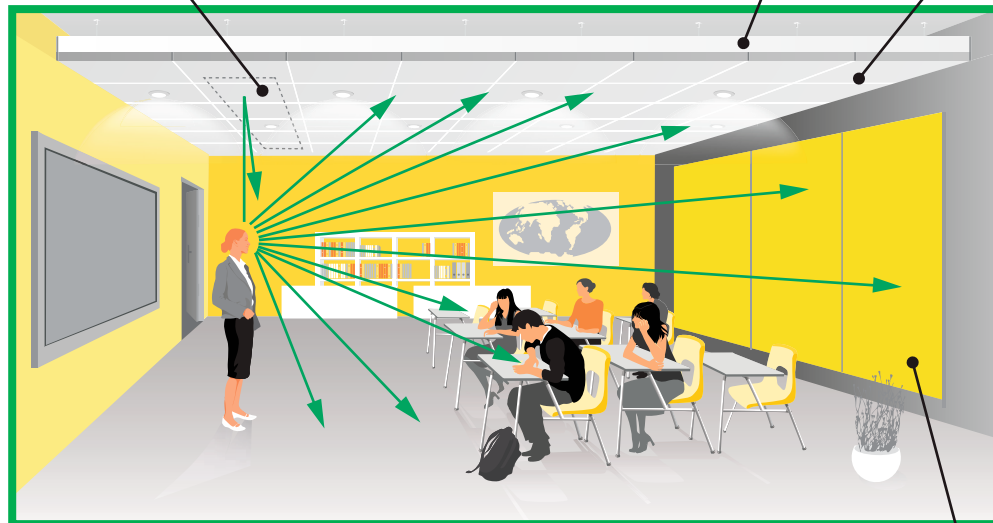


Good acoustics

Reflective panels

Low-frequency absorber

Absorbing ceiling



Absorbing wall panel

Tips for good acoustics

- Consider who the room is intended for, which people will spend time there – is age a restriction, number of people, etc.
- Take account of the surface finishes, the shape of the room, the volume and the furniture.
- Take account of the activities that will take place there.
- We know from research and experience that we must look beyond the reverberation time. Speech clarity and sound pressure levels also play an important role.

Hear the difference between classrooms with different acoustic levels in practice.

View the video of
Sweyne Park School at
[Youtube.com](https://www.youtube.com)



A good acoustic environment

What can you do?

Education forms the basis of the development of the individual and society, which means high requirements should be imposed on the working and learning environment in education. The indoor environment has a significant effect on the ability to garner and transfer knowledge. One of the most important but often the most underestimated factors is acoustics. In education, most knowledge is still transferred by means of speech. The quality of the acoustics in the teaching room can be decisive as to whether the education is successful or not. It is essential that this speech is heard properly. An integrated approach to sound, climate, air quality and light ensures a healthy indoor climate. This creates an optimum working and learning place for teachers and students.



Did you know that...

- A teacher in a room with good acoustics has a heart rate of 10 beats per minute less than a teacher in a room with poor acoustics?
- Acoustics influence the social behaviour of people?
- Acoustics influence the intellectual performance of students?
- More than half of teachers in primary and secondary education suffer from voice problems?
- Some physical education teachers took their employers to court for suffering hearing damage in the workplace and received compensation?
- Poor acoustics lead to stress, frustration, headaches and tiredness?
- Average working sound pressure levels in classrooms are above 65 dB? That a teacher needs to exceed that by 10-15 dB just to be heard?
- Acoustics influence the performance of the short-term memory?
- Young children are particularly sensitive?



Principles of good acoustics

1. Find out how people experience their acoustic environment and the effect of that environment

Start by asking people how they experience their acoustic environment and what their acoustic preferences would be.

2. Take account of the activity

Different activities require different acoustic properties. Establish what the room will be used for and use acoustic parameters, such as sound pressure level, sound propagation, speech clarity, or reverberation.

3. Use the relevant acoustic qualities and take the relevant measures

Acoustic experience is multidimensional, which means several acoustic parameters are required to define acoustic requirements and to ensure they are achieved.



Sound pressure level

When it is about reducing the noise levels, G (dB) is a relevant acoustic parameter



speech clarity

When it is about hearing speech as clearly as possible, D_{50} (%) is a relevant acoustic parameter.



Reverberation time

When it is about obtaining optimum reverberation, the reverberation time (sec) is the relevant acoustic parameter



125 Hz
Acoustic comfort

It is essential to prevent undesirable low-frequency sound, at 125 Hz in particular as this increases the irritating sound energy. It has a disruptive effect on acoustic comfort.

Would you like to know more?

Ecophon likes to work together with other organisations to share knowledge of acoustics in education. If you would like to know more about the influence of acoustics in the classroom, please visit www.ecophon.com.

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A SOUND EFFECT ON PEOPLE