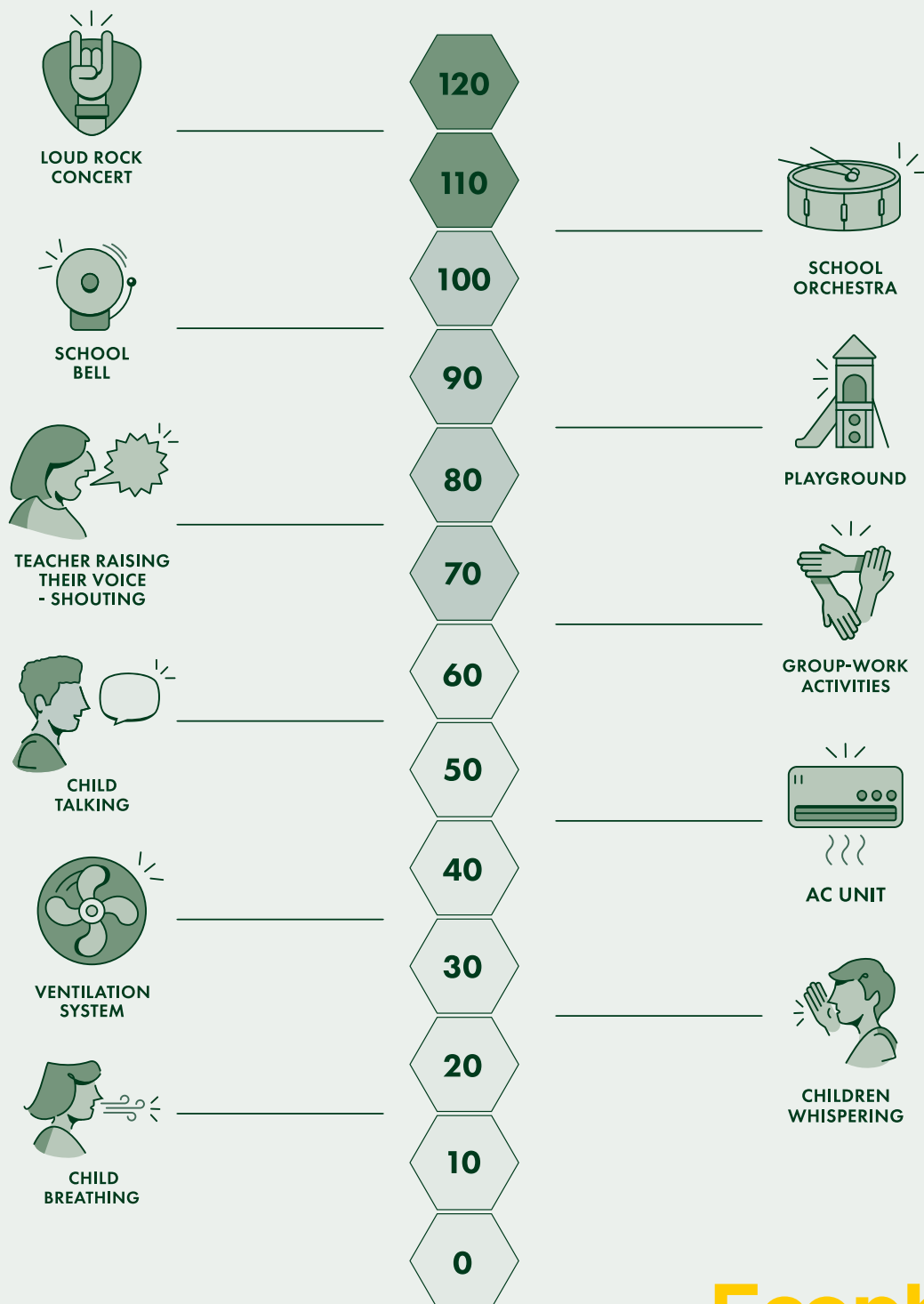


A SOUND RECOVERY FOR SCHOOLS

Mitigating noise in post-pandemic education
Saint-Gobain Ecophon 2022 Education Report



MOMENTUM FOR A SOUND RECOVERY

Children are among society's most vulnerable groups. This became evident during the pandemic. The long-term impact of more than 1.5 billion students being affected by school closures remains to be seen.

According to UNICEF, children risk being among the pandemic's biggest victims in the years to come. At least 463 million children were unable to access remote learning during the school closures in 2020.¹

But the learning gaps and mental health impacts for children have not gone unnoticed. On the contrary. Policymakers and the education sector have undertaken enormous efforts to close the gaps. Recovery plans are in place to build back better, more inclusive, and more sustainable societies.

In the EU, there has been a particular focus on a green recovery. Two notable and hopeful initiatives for the buildings sector include the New European Bauhaus initiative and the Strategy for a Sustainable Built Environment launched in 2021.

Recovery efforts are an opportunity for schools and education as well. The momentum can be harnessed, not only responding to the effects of the pandemic, but also to issues that caused learning gaps before the pandemic.

Ecophon Group's promise is »A sound effect on people«. For schools, this means having a positive impact on teachers and children – striving to improve their health, learning and wellbeing. We believe that barriers to learning lie in the design of the environment, not the child.

The World Health Organization's recent *World Report on Hearing* tells us two important facts about schools and their design. First, "Good acoustics are critical to learning for young children". Second, "Unsuitable acoustics present an even greater challenge for children with hearing loss or learning problems."²

A good sound environment in schools is necessary – especially for younger learners and students with special educational needs. Not only to improve learning and health, but for every child to be able to participate equally in society.

Building on the latest OECD PISA study, in this report Ecophon explores the issue of school noise today. We conducted additional school surveys in three European countries: France, Sweden, and the Netherlands. In exploring the extent and impact of noise, we hope to inspire collective efforts to improve the sound environment in schools.

With better school acoustics we can build back healthier, more inclusive, and more sustainable schools. That is the way to a sound recovery.

*Douglas MacCutcheon, PhD in cognitive psychology
Global Concept Developer for Educational Environments, Saint-Gobain Ecophon*

EXECUTIVE SUMMARY PER CHAPTER

1. Creating conditions for success: How we can mitigate school noise

Teachers, school administrators, architects and policymakers all have a role in creating more successful conditions for learning – schools with less noise.

- **Teachers** can manage background noise, encourage respectful interaction, and demand improvements from your school leadership and politicians.
- **School administrators** can recognise the noise in their school, how it impacts the work environment, and systematically address noise.
- **Architects and acousticians** can use Universal Design for Learning as guideline when designing schools and choose sustainable and health-promoting materials.
- **Policymakers** can invest in education, create conditions for equal learning and introduce mandatory acoustic controls.

2. School noise is a global problem

Over 80% of students in France, Sweden and the Netherlands state that there *sometimes or often* is too much noise at school. This report explores the issue of school noise: its extent, its impact, and how we can resolve it.

3. Noise harms health, teaching and learning

Students, teachers and children with special educational needs (SEN) are all impacted differently:

- **Effects on the overall student population:** Noise causes stress, headaches and learning losses. 60-75% of all students in surveyed countries state that noise prevents them from concentrating in the classroom.
- **Effects on children with SEN:** Studies show that children with SEN are more negatively affected by noise compared to typically developing learners.
- **Effects on teachers:** Voice health problems and stress are common among teachers in noisy schools. Noise in school is a work-environment issue.
- **The “lunch issue”:** Noise impacts student food intake, harming student health, performance, and causing more food waste. One out of three Swedish and Dutch students skip lunch or cut their lunch short at least once a week due to noise.

4. The important difference between sound and noise

Sound is wanted, noise is not. Most sound in schools come from the students themselves. The real barriers to learning – noise – lies in the design of the environment, not the children.

5. The downward spiral from sound to noise

The noise problem cannot be solved by raised voices, but rather by solving the problems that stand in the way of a good acoustic environment. Poor design choices, too many children in one class and highly reflective ceilings and walls are some of the conditions that turn sound into noise.

6. Is a good sound environment optional?

Many countries have acoustic standards similar to the WHO's recommendations. One problem is that standards in many countries are optional for refurbishments and existing facilities. Many acoustic standards also fail to meet needs of students with SEN.

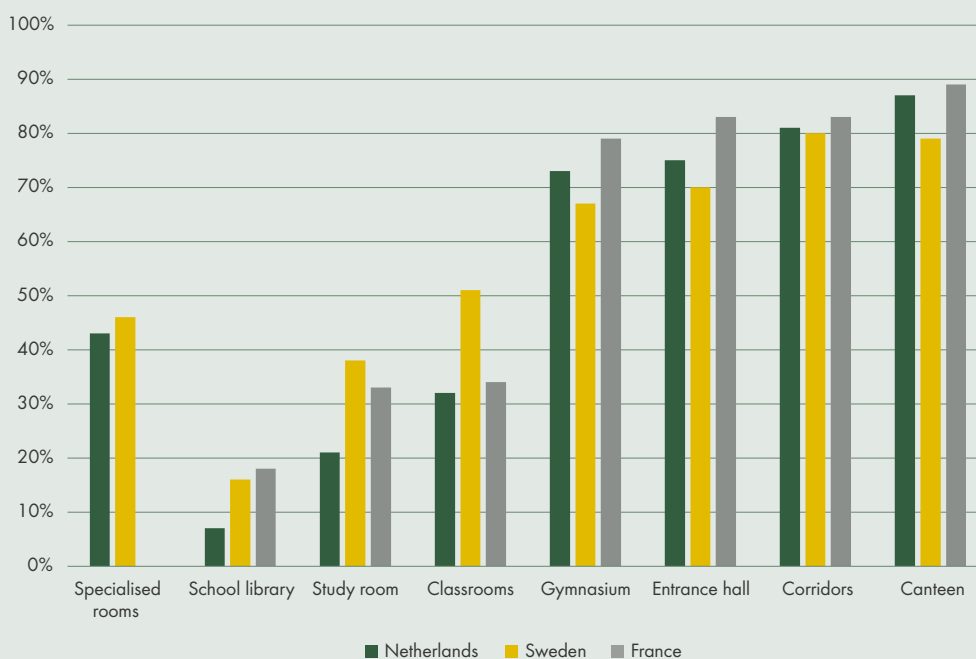
7. Beyond Covid: Learning losses are reversible

Most OECD countries have acted to close the learning gaps caused by the pandemic. This momentum should also be used to address school issues that pre-date the pandemic. Improving the sound environment is a good place to start – building back better, more inclusive, and healthier schools.

NOISE IN DIFFERENT SCHOOL FACILITIES

Students in France, Sweden and the Netherlands agree: the noisiest areas in schools are canteens, corridors, entrance halls, and gymnasiums. Classroom noise remains a problem in many schools. Even the libraries can be noisy.³

Question: How noisy do you find the following rooms at school when you and your classmates are using them? (Very noisy and Quite noisy)



1. CREATING CONDITIONS FOR SUCCESS: HOW TO MITIGATE SCHOOL NOISE

TEACHERS

- **Manage unnecessary background noise**

Take measures to reduce external classroom noise when possible, for example by closing the door to the corridor. Turn off projectors and machines when they are not used to eliminate unnecessary sources of classroom noise.

- **Encourage respectful interaction among students**

Conflict resolution and behaviour management strategies can mitigate student-generated sounds. Educate your classes on noise. For some students with special educational needs (SEN), consider strategic seating arrangements to reduce sound and sight distractions.

- **Demand improvements**

When physical upgrades and acoustic treatments in classrooms and school facilities are needed, organize parent groups and teachers' unions. Advocate for investments in universally designed sound environments and acoustic upgrades from school leadership and politicians.

SCHOOL ADMINISTRATORS

- **Recognise the noise problem in your school**

Our survey shows that 80% of students say that there is too much noise in school. But only 20–30% of students in OECD countries go to schools where their headmasters report that there is inadequate physical infrastructure (such as a lack of acoustic treatments)⁴. The noise problem must be recognised before it can be acted upon.

- **Recognise noise as a work-environment issue**

Voice problems and stress are common for teachers in noisy schools. Improving the acoustic environment of your school creates a more attractive working environment and healthier conditions for your staff.

- **Systematic work-environment management**

It is not always obvious to school leadership if, and where, the sound environment needs improvement. Regular acoustic controls help you find room for improvement. Consult experts on how to improve all aspects of the indoor environment: acoustics, lighting, ventilation, and more.

ARCHITECTS AND ACOUSTICIANS

- **Build back equal**

Barriers to learning are in the environment, not the child. Use universal design as a guideline when designing the physical environment. Aiming for acoustic standards that are optimised for children with hearing impairments helps all students. It is not a trade-off. The way forward is to design and build with high-quality sound absorption (sound absorption class A).

- **Build back better for the environment**

Consider how different materials help you minimise your environmental impact. When possible, choose materials that can be repurposed and recycled. Avoid greenwashing risks by demanding suppliers to provide product-specific Environmental Product Declarations (EPD).

- **Build back healthier**

Choose building materials that are conducive to a healthy indoor environment, both in terms of acoustic performance and indoor air emissions. Health Product Declarations and third-party certifications such as IAC Gold are good places to start.

POLICYMAKERS

- **Invest in education**

Historically, crises are often followed by cuts to national education budgets. Do not follow in these footsteps. In national recovery plans, prioritise education, high-quality indoor environments, and school refurbishments.

- **Create equal conditions for inclusive learning**

Promote national acoustic standards that are aligned with the WHO's recommendations at a minimum. Ensure all schools are designed and refurbished in a way that considers the vulnerability of young children as well as children with SEN.

- **Enforce the standards**

Introduce mandatory acoustic controls. Some countries already have these assessment systems in place for ventilation. Controls should be carried out regularly by certified inspectors, ensuring acoustic standards are met in new builds, refurbishments, as well as existing facilities.



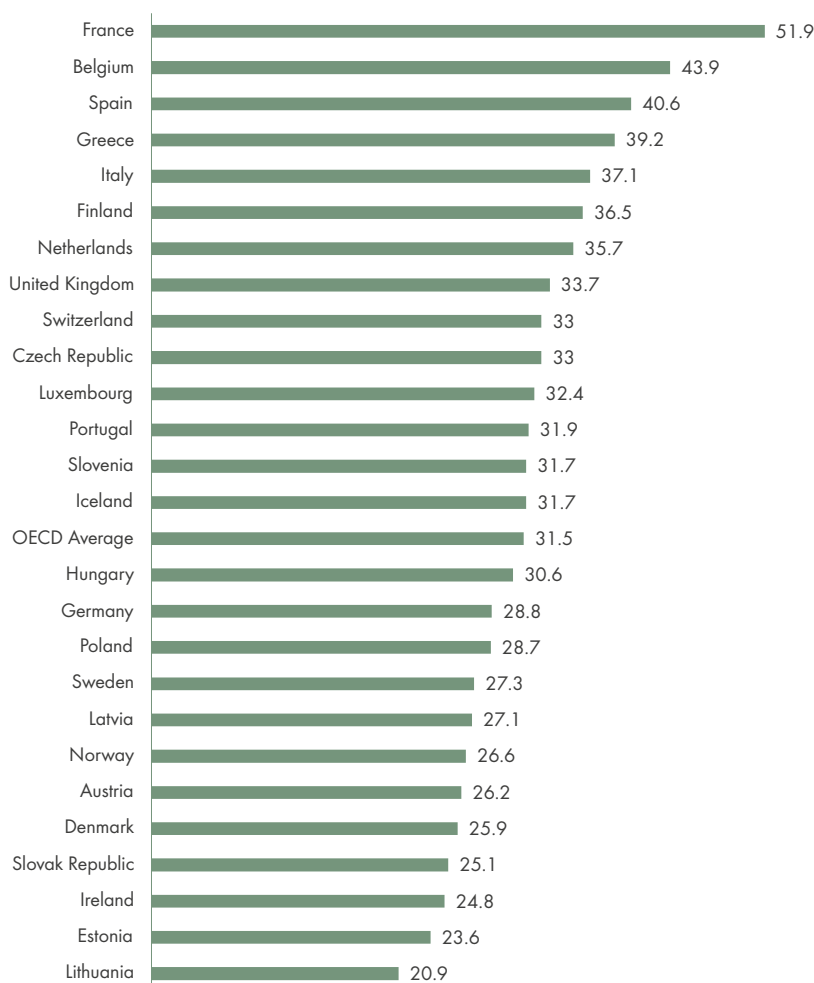
2. SCHOOL NOISE IS A GLOBAL PROBLEM

Many children spend nearly half of their waking hours in pre-schools and schools, surrounded by loud background noise and reflective surfaces. These facilities give them no real control over the sound levels they are exposed to.

The latest OECD PISA study, from 2018, gives clues on how large the issue of school noise is, even in some of the world's most developed countries. Approximately one out three 15-year-old students in OECD countries state that there is noise and disorder in most or every lesson.



Percentage of students who reported there is noise and disorder in most or every lesson.⁶

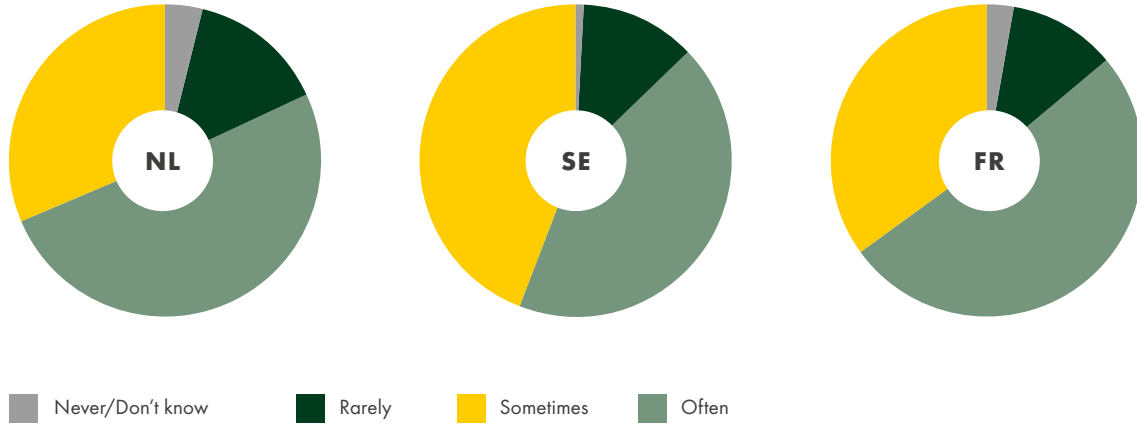


To further explore the issue of school noise, we have surveyed 1017 middle and high school students in Sweden, the Netherlands and France. Surveys in Sweden (257 students) and the Netherlands (254 students) were carried out by the global opinion research group APCO Insight in January 2022. The survey in France (506 students) was conducted by the research company OpinionWay in January 2021. French results are presented where questions allow for comparisons. Population samples were selected in such a way as to ensure that the survey is broadly representative of the wider school population.

The survey shows that an overwhelming majority of middle and high school students in all three countries agree that there is too much noise at school.

FREQUENCY OF TOO MUCH NOISE IN SCHOOL (%)³

Question: How often is there too much noise at school?



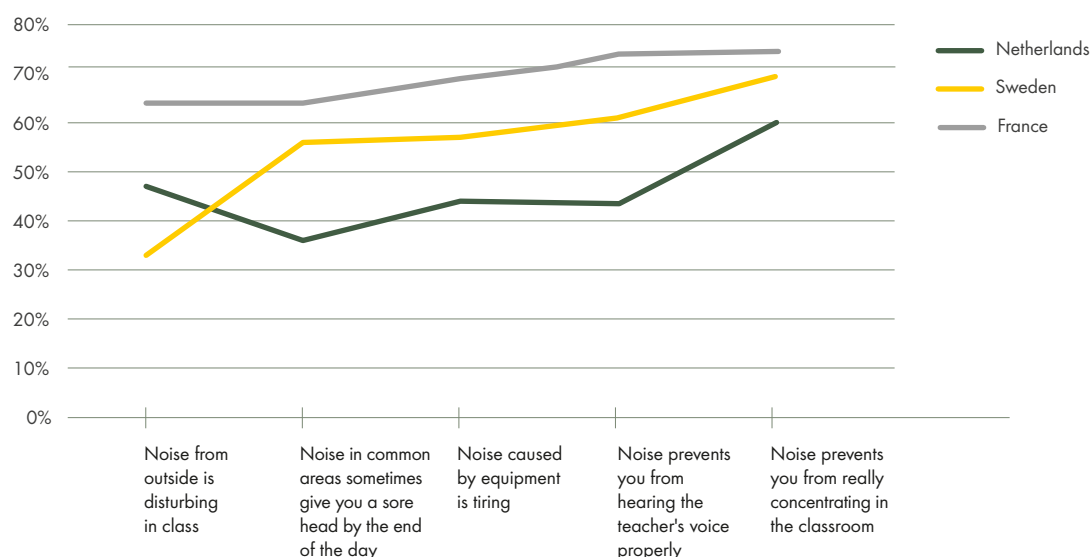
Students in all three countries encounter persistent noise problems.³ As many as 87% of Swedish students say that there is often or sometimes too much noise, compared to 86% of French students and 82% of Dutch students.

With this report we explore the issue of school noise: how common it is, why it is a problem, what its impact is, and how we can work together to resolve it.

3. NOISE HARMS HEALTH, TEACHING AND LEARNING

STUDENTS: NOISE IS TIRING AND DISTURBING

Question: To what extent do you agree with the following statements? (Totally or somewhat agree)



In our school survey, 60-75% of students in France, Sweden and the Netherlands state that noise prevents them from concentrating in the classroom. In both France and Sweden, most students find that noise is tiring and sometimes gives them a headache by the end of the day.³

SCHOOL NOISE CAUSES STRESS AND LEARNING LOSSES

Question: How often, if at all, do you find you experience the following at school?

	At least a few times a term		At least once a week	
	NL	SE	NL	SE
You feel stressed at school because of how noisy it is	59%	80%	38%	59%
You find it difficult to learn because of how noisy it is	75%	74%	50%	55%
You have a headache at school because of how noisy it is	49%	72%	33%	53%

Most students in both Sweden and the Netherlands find it difficult to learn due to noise at least once a week. Six out of ten Swedish students feel stressed at school at least once a week due to noise. More than half of Swedish students get a headache at least once a week due to noise.³

NOISY CANTEENS MAKE STUDENTS SKIP LUNCH

Question: On days when you have lunch in the canteen, how often do you experience the following due to noise levels?

	At least a few times a term		At least once a week	
	NL	SE	NL	SE
I find I am not as hungry as normal	31%	52%	24%	36%
I decide to skip lunch	30%	46%	19%	30%
I cut my lunch short	40%	38%	31%	24%

In both Sweden and the Netherlands, noise has a substantial impact on student food intake. School noise not only impacts student health and performance, but also leads to more food waste in schools as students cut their lunch short.

One out of three Swedish students say they skip lunch at least once a week due to noise. In the Netherlands, one out of three students cut their lunch short due to noise once a week.³

STUDENTS WITH SPECIAL EDUCATIONAL NEEDS ARE MORE VULNERABLE

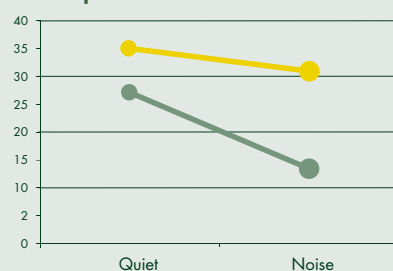
All students are affected by noise, but some more than others. Student groups with special educational needs (SEN) are particularly vulnerable, including:

- Students with hearing impairments
- Students with visual impairments
- Students with autism spectrum disorder (ASD)
- Students with attention deficit hyperactivity disorder (ADHD)
- Students with auditory processing disorder (APD)
- Students with speech, language, and communication difficulties (the most prevalent type of SEN in mainstream schools)
- Students not learning in their first language

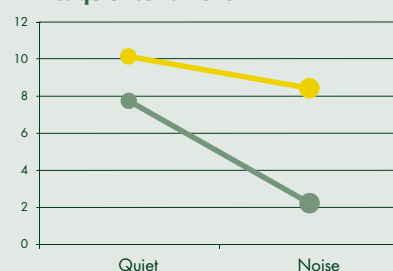
One study⁷ had students perform standardised tests in English and maths in rooms with different noise levels. Increased noise levels clearly lowered the scores in both subjects, with a more dramatic impact on English.

The same tests were done with students with hearing loss, attention problems and those learning in a second language. The results show children with SEN are significantly more negatively affected by noise compared to other learners.

Maths scores in noisy vs. quiet conditions



English scores in noisy vs. quiet conditions



■ Typical students ■ SEN students (Additional listening needs)

TEACHERS: VOCAL HEALTH PROBLEMS, STRESS, AND A POOR WORKING ENVIRONMENT

VOCAL HEALTH PROBLEMS ARE A THREAT TO TEACHERS

- In one study, the average noise level in classrooms with no acoustic treatment were 64 dB.
- 65% of teachers have had voice problems during their career, a UK study shows.⁹
- In another survey, 32% of teachers stated they have voice problems, compared to 1% of non-teachers.¹⁰

STRESS AND RAISED HEARTRATES

- More than one in four (26.5%) students in OECD countries state that their teacher must wait a long time for their class to quiet down in most or every lesson.⁶
- 80% of teachers are stressed by classroom noise.¹¹
- Good acoustics in the form of an acoustic ceiling with sound absorption class A reduces the average heart rate of teachers by 10 beats per minute (bpm).¹²

TEACHER TESTIMONIALS: WHAT HAPPENS IN CLASSROOMS WHEN ACOUSTICS ARE IMPROVED?^{13,14}

- Quieter and calmer classrooms improve working conditions for both staff and students.
- Better classroom behaviour and comprehension.
- Lower stress levels for teachers, especially those with less experience.
- Hearing-impaired students participate in classes more equally.

WHAT HAPPENS WHEN THE SOUND ENVIRONMENT IS IMPROVED?

- When acoustically untreated classrooms are given a ceiling with sound absorption class A, speech intelligibility improves by 35% and perceived noise levels are reduced by half.¹⁵
- Good acoustics increase the number of children achieving government targets on test scores by up to 13%.⁸
- Students work more inclusively and better together.¹³
- Sound levels in collaborative group work are reduced by up to 13 dB.¹²

4. THE IMPORTANT DIFFERENCE BETWEEN SOUND AND NOISE

Imagine sitting in the back of a classroom, listening to your teacher while your classmates are having a separate conversation in the front row. Most students would have a hard time piecing together what their teacher is saying. Especially when the teacher instructs on more complicated topics.



The ability to understand what your teacher says is a simple function of sound and noise. Sound being what you want to hear (your teacher's voice), noise being what you do not want to hear (background chatter from other students).

The level of wanted sound in relation to unwanted background noise is called **the signal to noise ratio** (SNR). The larger the ratio, the likelier you are to understand what is being said.

Even environments with low levels of background noise can create a poor sound environment if the **reverberation time** is too high. Reverberation is sound reflected off hard surfaces. Reverberation time is the time required for reflecting sound to fade away. Long reverberation time distorts and masks essential sounds (such as a teacher's voice) in a room as the sound reflections accumulate in the space.

Think of the last time you heard a message being announced at a train or a metro station. Even if it is otherwise quiet, the loud voice echoes back and forth between solid rock, reflective surfaces. The reverberation makes the voice difficult to understand; words overlap, and you may be left missing your train.

High levels of background noise, long reverberation times, or a combination of the two, means speech becomes difficult to understand. In other words, **the speech intelligibility** will be low.

Signal to noise ratio

The ratio between wanted sound level and unwanted noise level

Reverberation time

Time required for reflecting sound to fade by 60 dB

Bad speech intelligibility

Low signal to noise ratio and/or High reverberation time

YOUNGER LEARNERS HAVE GREATER LISTENING NEEDS

Learning environments for children must have good speech intelligibility to be inclusive and healthy. The younger the child, the greater the demand on high speech intelligibility (low reverberation times, and a high signal to noise ratio).

SOUND COMES FROM THE STUDENT, NOISE COMES FROM THE ENVIRONMENT

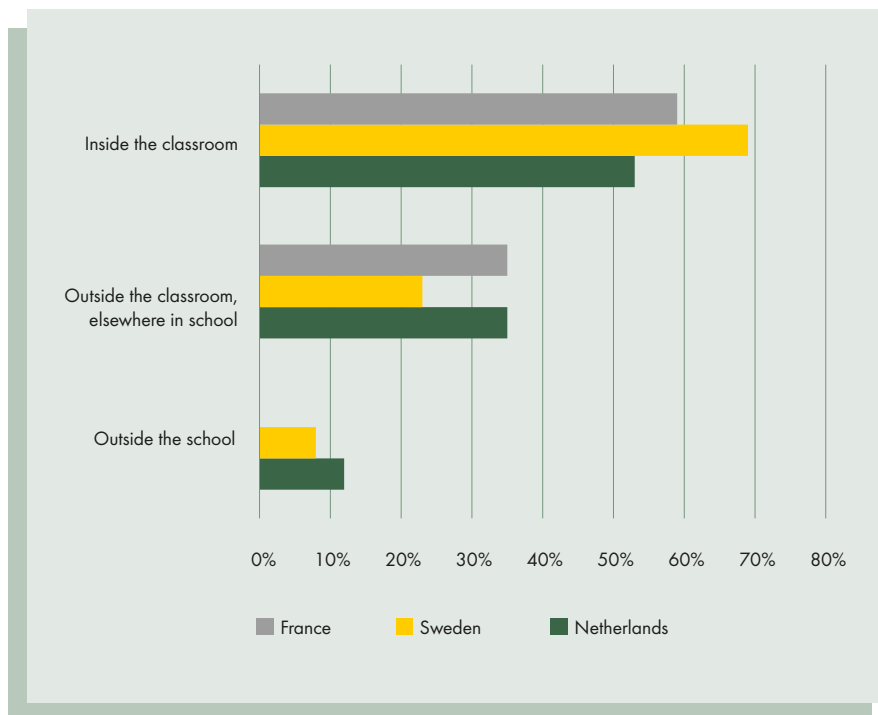
- External environmental noise (outside traffic, playground)
- Internal environmental noise (ventilation, corridors, chairs scraping floor)
- Student-generated noise during learning activities

Sound and noise come from a variety of sources; each school has its own challenges. Poorly insulated schools in inner cities may be more prone to noise from external traffic. Whereas old or poorly designed school facilities may face noise from neighbouring classrooms, ventilation systems, or corridors. Our survey shows that most classroom noise comes from inside the classroom.

While the most common source of *sound* is from the students themselves, the design of the environment is what turns the sound into *noise*.

CLASSROOM NOISE IS MAINLY INTERNAL IN ORIGIN³

Question: Concerning noise in classrooms, where would you say there is most noise?



5. THE DOWNWARD SPIRAL FROM SOUND TO NOISE

AGGRAVATING FACTORS FOR NOISE

- Reflective walls, floors and ceilings – often in old and unrenovated buildings
- Too many students in one school – often in countries or regions with low education budgets
- Poorly designed facilities – often in schools with non-inclusive or obsolete design

Even classrooms with little external background noise can have a poor sound environment. Ordinary speech turns into disruptive noise when schools, classrooms or canteens are poorly designed. A common example is ceilings, walls and floors that are made of hard, reflective surfaces.

THE VICIOUS CIRCLE OF NOISY CLASSROOMS

The natural response to long reverberation times and high levels of background noise is teachers and students raising their voices to be understood. This in turn leads to a vicious circle of noise.

Almost everyone has experienced this phenomenon. People talk in a noisy environment like a cafe, party or classroom. When subjected to background noise, they involuntarily begin to speak louder. One person raises their voice and everyone else follows suit, leading to an upward spiral in noise levels.

The upside is that the same logic applies when acoustics are improved. One study showed that an acoustic ceiling with sound absorption class A reduced sound levels by 3 dB, as well as reverberation times.¹⁵

However, the real change was in the behaviour of the people in the classroom. Since everyone could be heard and understood without raising their voices, students and teachers immediately spoke 7 dB more quietly. The result is a total reduction of 10 dB, effectively cutting the perceived noise level in half.

This really shows that the noise problem is not solved by raised voices or mere disciplinary actions. The way forward is to treat the factors standing in the way of a good acoustic environment.

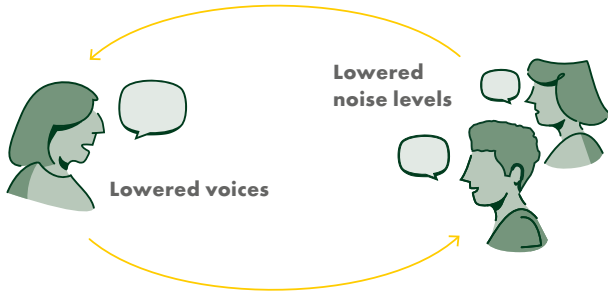
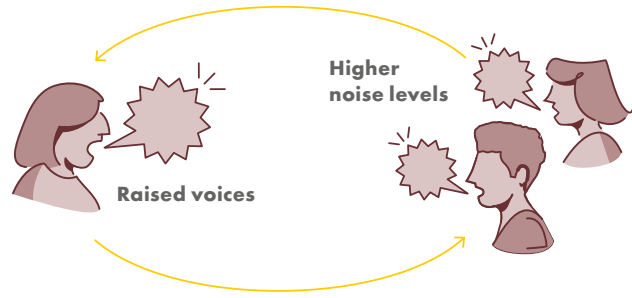
An improved sound environment means improved health, teaching, and learning. The consequences of inaction are high: loss of learning, student and teacher health impacts, and unequal opportunities for learning.

Still, the impact of noise on teaching and learning is all too often overlooked. Even in some of the world's most developed countries, the physical infrastructure and sound environment in schools are neglected. Nearly one in three students (32.5%) in OECD countries go to schools where headmasters report that instruction is hindered by inadequate or poor-quality physical infrastructure, such as a lack of acoustic treatments.



CLASSROOMS WITH NO ACOUSTIC TREATMENT

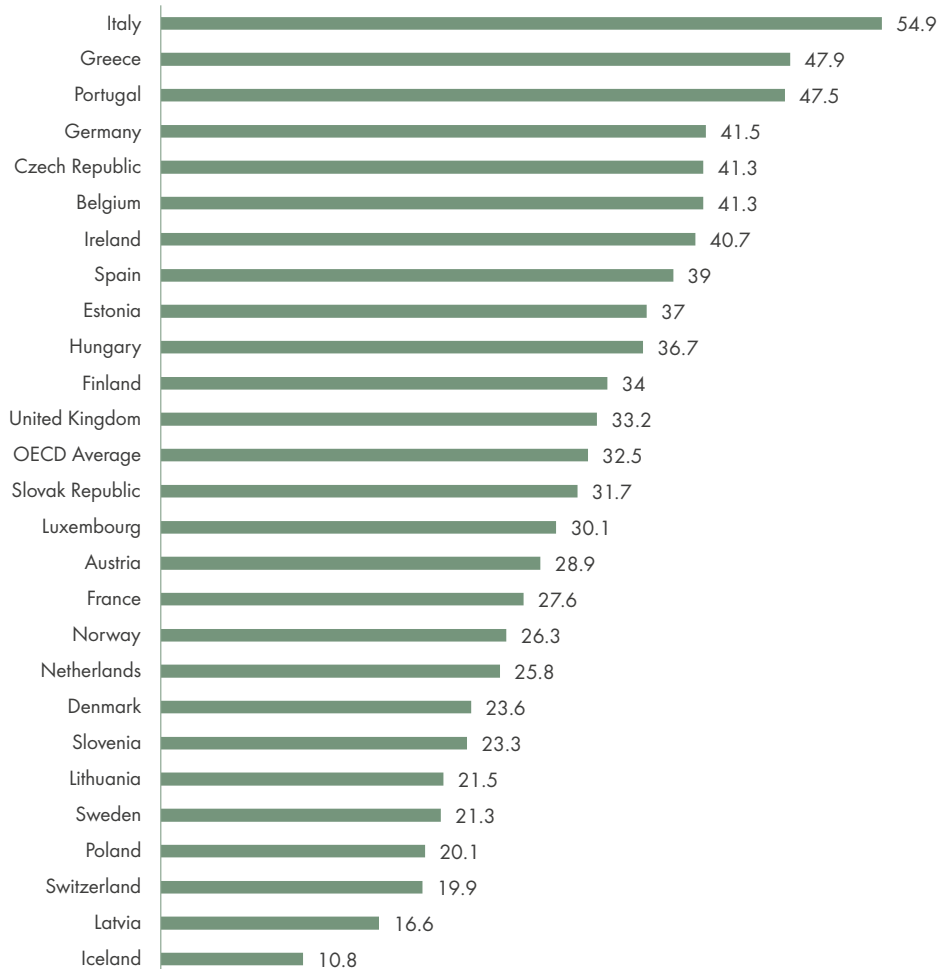
have longer reverberation time



CLASSROOMS WITH ACOUSTIC TREATMENT

have shorter reverberation time

PERCENTAGE OF STUDENTS IN SCHOOLS WHERE INSTRUCTION IS HINDERED BY INADEQUATE OR POOR-QUALITY PHYSICAL INFRASTRUCTURE (INCLUDING ACOUSTICS), ACCORDING TO THEIR HEADMASTER⁴



6. IS A GOOD SOUND ENVIRONMENT OPTIONAL?

Acoustic standards have a particular role in protecting children and teenagers, vulnerable groups with less control over their environment and the noise they are exposed to, according to the WHO.¹⁶ Regulations and standards are technical, and hard to understand for non-acousticians. But they fill a crucial function in providing equal opportunities for all student groups to succeed.

Acoustic regulations differ:

- Between school facilities (classrooms, corridors, canteens)
- Between countries and/or regions
- Between new builds and refurbishments of existing buildings
- Between classrooms for students with and without special needs

Good speech perception – understanding what is being said in the classroom – is crucial for healthy and effective learning. The WHO recommends that unoccupied classrooms have a background noise level of less than 35 dB.¹⁷ For younger children and students with special educational needs (SEN), the background noise level should be less than 30 dB.

Low reverberation time is another important factor for a healthy sound environment. Reverberation times are calculated depending on learners' specific needs, learning activities and classroom sizes. The Norwegian standard for educational facilities for students with SEN sets a good example – by requiring a reverberation time of less than 0.4 seconds.

Many countries have standards similar to the WHO's recommendations. The problem, however, is often not the standard's acoustic parameters. The issues are rather that:

- Many standards are optional – especially for existing schools and in minor refurbishments
- Many standards don't cover the needs of all students – especially students with SEN

1. Many standards are optional

Standards need to be enforced to have an impact. They tend to be mandatory in new builds (and, in some cases, major refurbishments). But most schools, classrooms and canteens are already built – and many are old. In practice, the acoustic environment in old schools can (and does) remain overlooked for years. And even when major refurbishments are made it is often optional to include acoustic measurements and treatments.

Systematically neglecting the acoustic environment negatively affects student health, performance, and quality of learning. One way to remedy this issue is to introduce mandatory acoustic controls. Regularly assessing the need for acoustic improvements means systematically identifying room for improvement.

Solution: Introduce mandatory acoustic controls to systematically identify room for improvement in existing facilities. Include acoustic measurements in refurbishments.

2. Many standards don't cover the needs of all students

Schools and acoustic standards must be universally designed in order to fit the needs of all students. Many countries have special regulations and recommendations for children with special needs (and for good reason). For example, the United Kingdom requires a maximum background noise level of 35 dB for newly built, unoccupied, classrooms, but a maximum of 30 dB for classrooms students with special health care needs. This is in accordance with the WHO's guidelines.

But many SEN students go to the same schools as the rest of the student population. In the UK, 71% of children with autism spectrum disorder¹⁸ and 78% of children with hearing loss¹⁹ are educated within "mainstream schools". Failure to account for this when designing, refurbishing, and building schools means that the needs of a large group of students are unaccounted for.

Architects, acousticians, and the construction sector can and should aim at the acoustic standards for SEN schools, even when designing "mainstream schools". It is not a zero-sum game. Universal design – building schools with the needs of the most vulnerable in mind – benefits everyone. It is proven to improve the health and learning of the entire student population, providing equal opportunities for all to succeed.

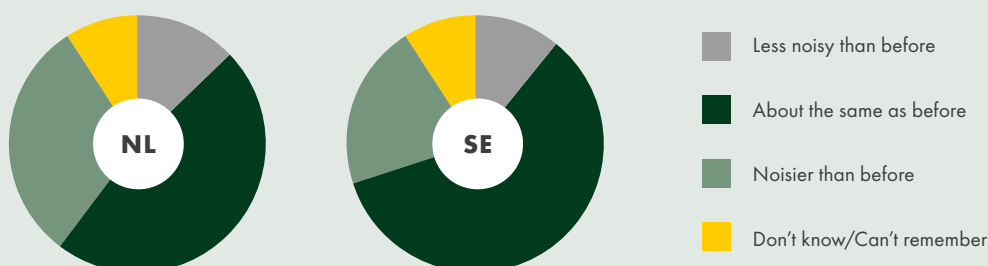
Solution: In "mainstream schools", aim for acoustic standards that are optimised for SEN students. This is achieved through high quality sound absorption (sound absorption class A).



7. BEYOND COVID: LEARNING LOSSES ARE REVERSIBLE

A DISTURBING TREND: SCHOOLS ARE GETTING NOISIER³

Question: Compared to before the COVID-19 pandemic, does it feel like school is more or less noisy?



Two years of a global pandemic disrupted all levels of our educational systems. As many as 1.5 billion students were locked out of their schools, many transitioning to periods of online learning.²⁰ Several studies raised concerns about the learning losses, mental health impacts and increased inequalities caused by the prolonged transition to remote learning.

For example, in the UK during the autumn 2020 term, learning losses in reading at the secondary level were an estimated 1.8 months in the overall student populations. Notably, the learning losses were 20-30% higher for disadvantaged student populations.²¹

Another Dutch study from 2021 concluded that many students made no progress whatsoever when learning from home. Learning losses were up to 60% larger for disadvantaged students.²²

But experts tend to agree that the learning losses are reversible. In France, for instance, the learning gaps observed in September 2020 had already been reversed by January 2021. But it took much longer for students from disadvantaged schools to recover the learning losses.²³

Important measures have been taken to close the learning gaps caused by the pandemic.²⁰ Following the first closure in 2020, 78% of OECD countries implemented measures to reduce students' learning gaps, and 70% implemented these measures with a special focus on disadvantaged students. Despite economic uncertainties, two thirds of OECD countries increased their education budgets in 2020. Another 75% increased their education budgets in 2021, taking further steps to close the learning gaps.

While no country has decreased education funding yet, previous economic downturns reveal that education budget cuts lag the emergence of crises. During the 2008 financial crisis, public funding to education increased even when the economy slowed down. Austerity measures and budget cuts did not reach the education system until 2010, two to three years into the crisis. One third of OECD countries ended up cutting education budgets in 2010.²⁴

With action being taken to make up for lost learning, it is crucial to not lose momentum. The perspective adopted during the pandemic can be used to combat issues that pre-date the pandemic – issues that have caused learning losses, health impacts and inequalities for decades. Including noise.

Too little attention is given to noise, a crucial “pre-existing condition” that causes learning gaps. Neglecting the noise issue in schools risks further widening the learning gaps. Barriers to learning are in the design of the environment, not the child. We need to work together to remove these barriers. That is the perspective needed for a sound recovery for schools.

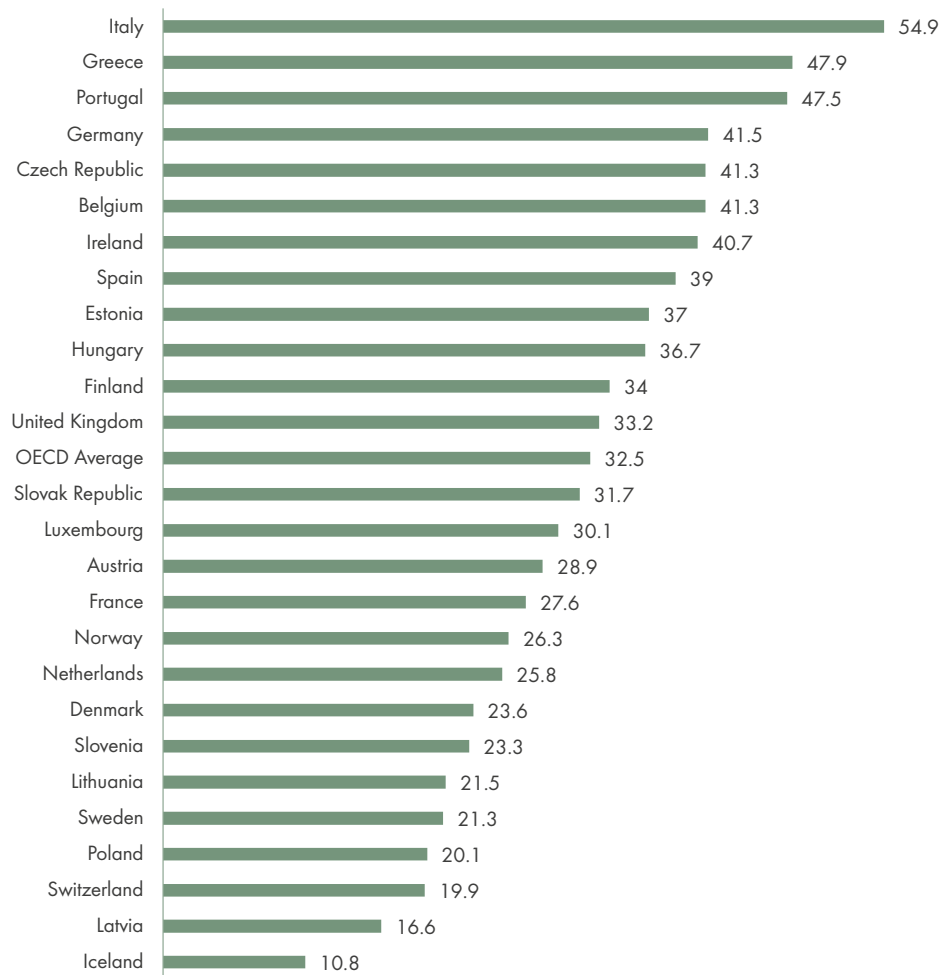


ANNEX: NOISE, EDUCATION AND RENOVATION PER COUNTRY

PHYSICAL SCHOOL INFRASTRUCTURE ACCORDING TO HEADMASTERS⁴

	Percentage of students in schools whose headmaster reported instruction is hindered by a lack of physical infrastructure (including acoustics)	Percentage of students in schools whose headmaster reported instruction is hindered by inadequate or poor quality physical infrastructure (including acoustics)
OECD Average	33.1	32.5
Austria	28.4	28.9
Belgium	41.2	41.3
Czech Republic	38.1	41.3
Denmark	19.7	23.6
Estonia	37.6	37.0
Finland	25.8	34.0
France	29.3	27.6
Germany	36.9	41.5
Greece	46.1	47.9
Hungary	44.5	36.7
Iceland	17.6	10.8
Ireland	44.6	40.7
Italy	53.0	54.9
Latvia	15.5	16.6
Lithuania	21.8	21.5
Luxembourg	34.7	30.1
Netherlands	22.4	25.8
Norway	21.6	26.3
Poland	14.7	20.1
Portugal	43.5	47.5
Slovak Republic	29.0	31.7
Slovenia	31.6	23.3
Spain	42.4	39.0
Sweden	20.2	21.3
Switzerland	19.0	19.9
United Kingdom	33.6	33.2

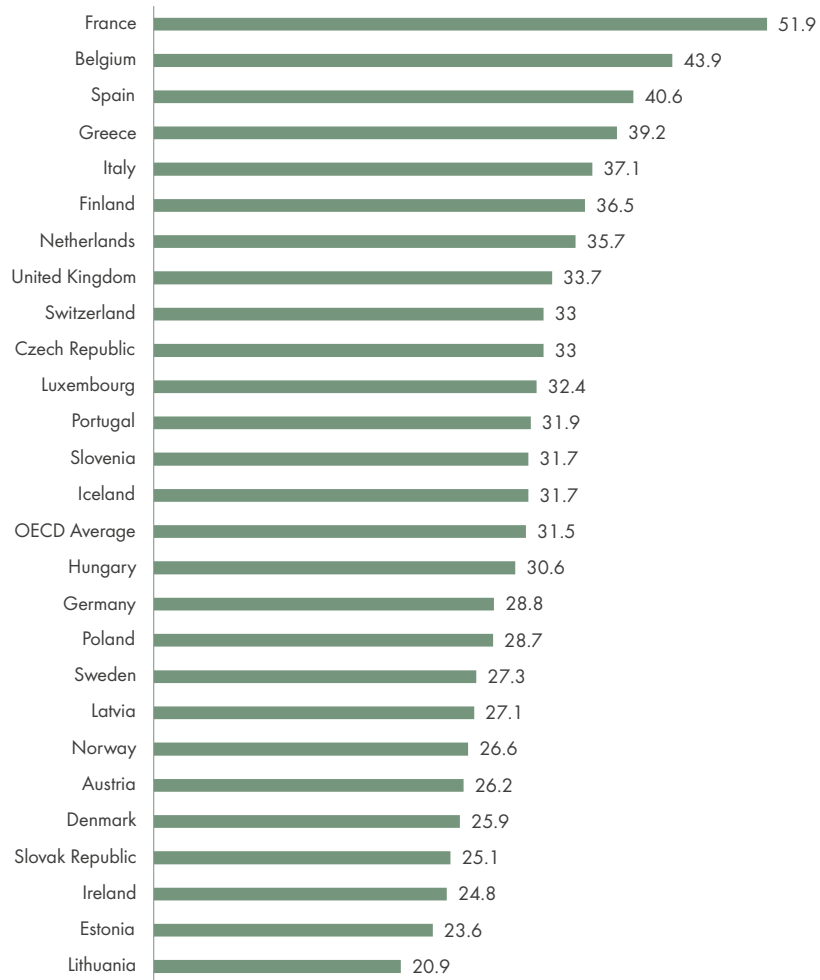
PERCENTAGE OF STUDENTS IN SCHOOLS WHERE INSTRUCTION IS HINDERED BY INADEQUATE OR POOR-QUALITY PHYSICAL INFRASTRUCTURE (INCLUDING ACOUSTICS), ACCORDING TO THEIR HEADMASTER⁴



NOISE AND DISORDER ACCORDING TO THE STUDENTS⁶

	Percentage of students reporting there is noise and disorder in most or every lesson	Percentage of students reporting that the teacher has to wait a long time for students to quiet down in most or every lesson
OECD Average	31.5	26.5
Austria	26.2	26.6
Belgium	43.9	37.1
Czech Republic	33.0	28.7
Denmark	25.9	13.7
Estonia	23.6	20.0
Finland	36.5	27.5
France	51.9	38.9
Germany	28.8	29.2
Greece	39.2	33.6
Hungary	30.6	28.7
Iceland	31.7	24.3
Ireland	24.8	25.6
Italy	37.1	30.2
Latvia	27.1	22.2
Lithuania	20.9	18.5
Luxembourg	32.4	29.4
Netherlands	35.7	34.0
Norway	26.6	22.3
Poland	28.7	26.5
Portugal	31.9	28.0
Slovak Republic	25.1	35.6
Slovenia	31.7	28.4
Spain	40.6	39.2
Sweden	27.3	26.4
Switzerland	33.0	25.7
United Kingdom	33.7	25.5

PERCENTAGE OF STUDENTS WHO REPORTED THERE IS NOISE AND DISORDER IN MOST OR EVERY LESSON.⁶

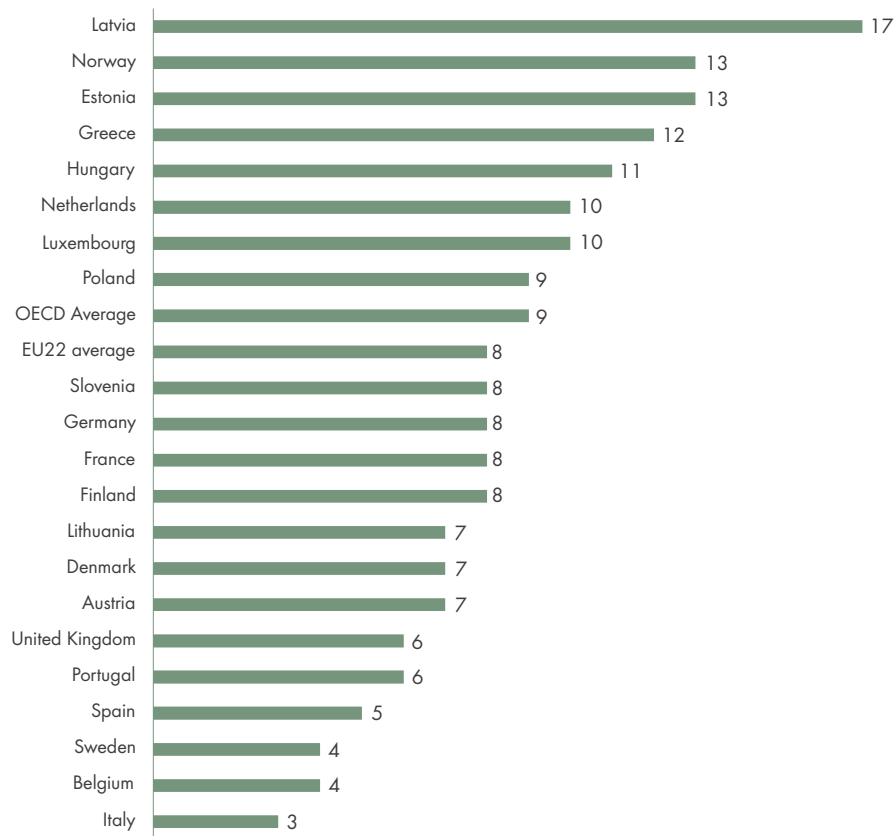


EDUCATION RESOURCES SPENT ON CAPITAL EXPENDITURE *25

	Percentage of Education resources spent of capital expenditure (construction, renovation, repair of buildings, equipment) – Primary to tertiary	Capital expenditure per full-time equivalent student in public primary schools (equivalent USDs converted using PPPs)
OECD Average	9	980
Austria	7	1164
Belgium	4	819
Czech Republic	N/A	1396
Denmark	7	972
Estonia	13	1329
Finland	8	1145
France	8	1031
Germany	8	N/A
Greece	12	706
Hungary	11	871
Iceland	N/A	890
Ireland	N/A	670
Italy	3	335
Latvia	17	1223
Lithuania	7	476
Luxembourg	10	2528
Netherlands	10	1416
Norway	13	2422
Poland	9	808
Portugal	6	363
Slovak Republic	N/A	393
Slovenia	8	884
Spain	5	160
Sweden	4	615
Switzerland	N/A	677
United Kingdom	6	268

**Capital expenditure refers to spending on assets that last longer than one year, including construction, renovation or major repair of buildings, and new or replacement equipment.*

PERCENTAGE OF EDUCATION RESOURCES SPENT ON CAPITAL EXPENDITURE (CONSTRUCTION, RENOVATION, REPAIR OF BUILDINGS, EQUIPMENT) – PRIMARY TO TERTIARY²⁵



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