Design for Diversity

Universal Design in Schools and Kindergartens in Norway

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This booklet was inspired by the members of KS Network for Universal Design, established in 2013. The goal is to contribute to an inclusive society by sharing best practices and removing barriers.

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Universal design – we need to do it together

Universal design is a value-based concept and a tool to include diversity in human abilities as a core parameter in design and planning. The concept can be interpreted as a mindset, a process tool or as a tangible design solution.

SINCE ORIGINALLY DEFINED, it has been further developed in various contexts and in a dynamic process. It has been written into the UN Convention on the Rights of Persons with Disabilities (CRPD) as a core concept and as such it also serves as a potential lever for securing the pledge to Leave No One Behind (LNOB) in the global effort of implementing the Sustainable Development Goals (SDG).

Universal design is a dynamic concept needing to be implemented in a context specific approach. To unleash its potential, it is decisive to work across scale, sector, discipline, and process. Prioritizing interdisciplinary collaboration, exchange of experiences, sharing of examples, development of new methods and investigation of research-based knowledge is all crucial to the process of implementing universal design in planning, design and use of our built environment.

American universal design pioneer and architect Ron Mace initially wanted to challenge the idea of a 'them and us', 'disabled and abled' and instead create a concept that could enhance the understanding of all users living with different and changing abilities throughout a lifespan. He reacted to the existing approach of designing solutions in a fragmented and detailed manner, instead of thinking, process, knowledge, collaboration, values, and complexity.

Universal design can be interpreted and implemented in various ways, and requires different skills, types of knowledge and collaboration. And whether implemented in theory, policy or practice, the work needs to be based on a constant sharing of experiences and innovation. We need to share knowledge and inspire each other. There is not one static or set way of interpreting universal design, and hence it is decisive to seek inspiration and knowledge outside of our own professional framework. Collaboration across disciplines, types of knowledge and experiences, geographical settings, different uses and roles in the building sector and knowledge field. We all need to interact, challenge each other, and collaborate.

“There is not one static or set way of interpreting universal design, and hence it is decisive to seek inspiration and knowledge outside of our own professional framework”

Camilla Ryhl.

Designing, planning, and building the physical framework for our lives is a complex process with many different actors involved. The process itself is highly interdisciplinary, and requires different skills and types of knowledge, as well as consistent communication and collaboration. Universal design does not fall into one aspect of the built environment, but across the entirety of it. When a student goes to college, she needs to get from her home to the bus stop, access the bus as well as exit it. Then she needs to cross the street and get to the building, locate and enter her classroom, participate in class and take her exams. She needs to take part in study trips, lunch in the canteen and social activities. Securing universal design in this chain of activities spans across different disciplines, policies, and sectors. Her example underlines the complex interdisciplinary relation between planning and design of the built environment and the actual use and experiences of it. The classroom needs to be accessible, as does the pedagogical approach, curricula planning, and the legislation and policies granting her the necessary assistive technology.

Securing an inclusive environment and society through universal design is indeed an interdisciplinary process and task. And we need to do it together. Learn, share, fail, succeed, and explore together. Just as Mace intended us to.

Camilla Ryhl
Architect MAA, PhD, Head of Research and Development, Bevica Foundation in Denmark.

BUILDINGS

Less sound, more comfort

Screeching whistles, loud shouting and bouncing balls. The old sports hall at Sandefjord Upper Secondary School gave teachers and students headaches from bad acoustics.

PARTITION WALL: Three partition walls divide the sports hall. These walls are soundproof, in comparison to the walls in the old sports hall. From left, Eline Byre, of the Student Council, Morgan Liljebäck, Departmental Head of Sports Education in Sandefjord Upper Secondary School, Headteacher Harald Møller and Liljebäck's predecessor, Tor Hansen.

MORGAN LILJEBÄCK MANOEUVRES the ball across the parquet floor, bends his knees slightly, aims, jumps and flicks the ball into the net. He is Head of the Sports Department at Sandefjord Upper Secondary School and is standing in the middle of the new building that was finished in 2019.

24 years earlier, Liljebäck's predecessor, Tor Hansen, started at the same school. His thick, red binder is full of papers telling the story of a long process that ended in a magnificent building – at the heart of which are sound, light, accessibility and quality.

NORWAY'S LARGEST

No other upper secondary school in Norway has as many students as Sandefjord Upper Secondary School, with 2100 students. It has vocational and academic courses, is a certified dyslexia friendly school and a hub for hearing impaired students in Vestfold County. This means that the school has a particular responsibility to facilitate students with hearing impairments.

The school opened in 1996, with 1400-1500 students. The numbers grew considerably. In 2013, Hansen took the first initiative and asked the local council for a new sports hall. The old one was from 1994 and had a capacity of 1350. In order to fit everyone in the school rented another hall nearby, but even that didn't accommodate everyone. Hansen sent an application to the county council.

"First we had an offer of 20 million Norwegian kroner but that wouldn't have been enough," Hansen says.

A LONG PROCESS

In 2017, after years of rejected proposals, Vestfold County Council allocated 60 million Norwegian kroner to build a new sports hall on the school grounds.

"It was a really happy day," Hansen recalls.

The planning of a sports hall for the future began. Five user groups were involved and the voice of the students was strong and instrumental.

"Some wanted communal showers, but expressed a strong desire for both cubicles and partition walls in the showers," says Eline Byre, member of the Student Council.

"A survey showed that only half the students dared to shower after a workout in the sports hall. That is not great if you start the day with physical education (PE) and have many other lessons after that," she says.

DIFFICULT SOUND CONDITIONS

Both teachers and students agreed that a new building needed to have better acoustics.

"When several classes had PE simultaneously in the old sports hall, noise was a real issue. People were shouting, balls bouncing and teachers giving instructions. It was very distracting and many complained of headaches from the constant noise and the stuffy air," Byre remembers.

"We didn't get as much out of the lessons as we could. It was a paradox that PE, which should give energy, just left people feeling even more exhausted.

Headteacher Harald Møller agrees: "The intention is the opposite; it is both required by law and a clear goal that if there is one place that the students ought to be allowed to relax and regain their energy, it is during PE lessons in the sports hall. It is an overall goal that the students should be inspired to continue with sports and take care of their physical health. If their experience from doing sports is having hea-

CLEAR SPEECH: Partition walls in the shower were a wish from many of the students. And that is what was built, says Eline Byre of the Student Council.

daches and feeling unwell, then they are unlikely to pick them up again later."

DEMANDING AND TIRING

Even Morgan Liljebäck has felt the effects of the old sports hall on his body.

"Steel sports halls, for example, have extreme acoustics. The sound bounces off the walls and it sounds like there are 10,000 people there, even though there might only be 200. It's one thing to have one session a week in a space like that, but for the teachers, who have the hall as their workplace, with maybe two to three sessions per day, that is full on. I remember from previous work places, after a day in the sports hall I'd always come home with a headache." Liljebäck is sensitive to noise, and searched for more administrative work to get out of the sports hall.

"Good acoustics are essential. My capacity for work nearly doubled when I left an ordinary teaching position for a managing role. Even though the workload increased, I got my own office."

NEW NORM

Being in the new sports hall is completely different for Liljebäck. His predecessor, Tor Hansen, agrees:

"Many sports teachers have struggled with the noise conditions. They might have PE lessons three times a day and that becomes a heavy load. Sports teachers retire earlier, at 62, but our aim is to create such a good working environment for both teachers and students that they can work longer," Hansen explains.

SOUND ABSORBING PARTITIONS

In the old sports hall, the plastic walls only gave a visual partition between the different zones. In the new 1600 km2 hall the partitions also absorb sound. Hansen points to a metre wide slot in

NEW WORK ENVIRONMENT: The sports hall has given both teachers and students a new experience of PE lessons, according to Morgan Liljebäck, Departmental Head of Sports Education at Sandefjord Upper Secondary School.

«When several classes had PE simultaneously in the old sports hall, noise was a real issue.»

Eline Byre

the wall into which the thick fold-down partition wall can slide. The hall has three such walls and each of the three sections can be divided by nets, creating a total of six arenas. The walls are covered with acoustic wooden slats with sound absorbing sheets behind.

"Both the sheets and the fact that the slats are mounted with a small gap absorbs sound. Additionally, the whole building is constructed in cross laminated timber, which gives good acoustics too," Headteacher Harald Møller explains.

Colourful lines on the floor draw up different courts for handball, volleyball and bandy. The hall qualifies for premier league matches.

Even the floor is made of wood.

"So-called sports floors are usually cheaper than parquet to lay, but parquet lasts practically forever. All it needs is regular sanding and varnishing," Tor Hansen says.

"This floor is made for activity, it flexes slightly and will hopefully cause fewer accidents," Morgan says.

ACOUSTICS SPECIALIST

The hall is not only used for sports, it is also the school's assembly hall – and examination hall. That is another reason for the parquet floor, as chairs would have made marks on a sports floor. "Good sound conditions are very important during exams. It is crucial to be able to concentrate, and the noise from people eating, drinking and moving can be distracting. It's great to be able to eliminate as much noise as possible," Eline Byre says.

Reidar Bjørge Andersen was project manager for the building of the sports hall.

"Our focus was on the demands and wishes from the school and the quality of the indoor environment, of which noise was a particular part."

As part of their research, they visited several other sports halls.

"We weren't very impressed with what we experienced in terms of noise quality and brought in an acoustics specialist from early on," says Bjørge Andersen, now retired.

LONG STORY: The red folder tells the story of the creation of the sports hall. Tor Hansen, instigator and key person for the project, stands outside the new building.

MEETING NEEDS

A well equipped 150 km2 gym is situated next to the hall. It is used by the students at the Sports Academy, and by 10-15 students who, for various reasons, are unable to participate in the PE lessons with the rest of their class.

"They have been given a completely new exercise situation, both through individual adaptations in the training studio and being able to use individual changing rooms. Without this possibility, many of them might not have had the opportunity to complete the PE curriculum. Now we will probably pass 90 percent of the students," Liljebäck says.

The facility has six changing rooms, each with five showers divided by partitions. Each changing room has a completely private individual shower and there are several areas equipped to meet the needs of students with different functional abilities.

The facility is also used by students at the

FOLD-AWAY: The handball goals can be folded away. “Everyone thinks that the sports hall is so light and nice,” says Eline Byre, of the Student Council.

PARTITION: Three such partition walls divide the hall. Unlike the old walls, these do not let noise through.

CLEVER SLATS: Wooden slats are mounted on the outside of sound absorbing sheets, Tor Hansen explains to Headteacher Harald Møller.

"Work and Life Skills" course (AHT).

"Many use wheelchairs, and it is much better to hold the classes here, rather than in the old sports hall with lifts and stairs. Here you can simply wheel straight in," Liljebäck says.

LIGHT

The light floods through the massive hall. It has continuous light and doors in dark colours give clear contrasts. Windows of normal height are marked with colour panels, from an art project.

"The old building seemed so dark and confined. Everyone thinks it is so light and nice here", Eline Byre says. She is pleased that the students were listened to.

"The challenges we identified really have been met."

Headteacher Møller tells of one of the PE teachers and his new working environment in the new hall:

"This teacher was so used to having his voice bounce off the walls in the sports hall that he now finds the acoustics so good that he has to raise his voice a little. That is a real luxury problem!"

> **"The challenges we identified really have been met."**
>
> Eline Byre

Improved focus with the right light

A Danish school discovered that lighting can be used for more than illumination. It can reduce noise and increase focus among students.

LIGHTING IS CRUCIAL for learning. It affects how people focus, learn, rest, sleep and wake up. Human-centric lighting is thus of utmost importance when constructing new school buildings. By using light in a new way, learning and participation can be optimised.

LIVING ROOM LAMPS IN CLASS

Fredriksbjerg School in Aarhus, Denmark, uses light to reduce noise. Exchanging classic fluorescent ceiling lamps with pendant lighting, created a more homely ambiance you normally find in living rooms. This reduced noise and improved the students' ability to focus.

In her PhD thesis, Dutch lighting designer Imke Wies van Mil has studied this rather simple measure at Fredriksbjerg – in collaboration with The Royal Danish Academy of Fine Arts – Schools of Architecture, Design and Conservation (KADK) and architectural firm Henning Larsen.

She installed pendant lighting in the pre-

Lighting does not just illuminate a room, it affects behaviour.

mises, creating different zones of focused light, rather than – and in contrast to – the usual evenly distributed light.

Van Mil measured the results: In 75 % of the places and situations measured, noise levels in the classroom were reduced by six decibels. A three to six decibel change constitutes a big difference to human hearing.

RECESS – WHO NEEDS IT?

Frederiksbjerg School is as unique as it is innovative. It has been designed to comply with new requirements for physical activity throughout the day. For instance, the children do not have recess! The idea is that you do not need a break from learning. Instead, movement is part of the building's DNA, according to architectural firm Henning Larsen, which designed the school. For instance, when moving from one place to another, children pass through climbers, obstacle tracks and other playground equipment. Locomotion becomes a fun, developing challenge. There are more than 100 ways to move about the school. The architects involved the users extensively in order to map needs.

ILLUMINATED

The communal rooms are divided into zones. A variety of lighting frames group activities and individual immersion.

Light intensity varies throughout the school day, as does the reproduction of colours and the amount of daylight. It all affects how a room is perceived. The architects focussed on including daylight in a varied and inspirational learning environment.

The windows are large in the middle of the building, smaller on top and even smaller on the lowest level. This allows for daylight to flow naturally through the classrooms, changing throughout the day. This far north, however, daylight is limited during winter. Hence, it was equally important to find the right artificial lighting.

This is why the Henning Larsen architects tested the effect of pendant lighting in Frederiksbjerg School. And the result? They decided to keep the pendants permanently.

LESS NOISE, MORE FOCUS

Principal Jette Bjørn Hansen is convinced that children who get a chance to focus on their

school work are more content.

According to researcher Imke Wies van Mil, an extra, focussed light source has the greatest impact on children who normally struggle to concentrate. An assumption confirmed by teachers, who previously never really thought about how uniform ceiling lights affected children.

Students losing focus by the end of the day is a well-known phenomenon. When lighting is uniform, it is difficult to decide where to sit. By putting a low-hanging pendant light above the desk, students are drawn towards the light and invited to work.

A small, illuminated area creates a framework. It also creates a boundary to the world, reducing disturbances. When doing group work, the light creates a shared space. Teachers say pendant lighting creates a less sterile and more cosy ambiance that children perceive as safer and more comfortable.

EMPIRICAL EVIDENCE

Other research shows that people associate different emotions with different types of lighting. In Danish culture, as well as Norwegian, soft lighting is associated with a calm and intimate ambiance. This indirectly affects the students by calming them down. Different lighting satisfies different needs. It is therefore just as important for children to be able to regulate the light and adjust it to different activities, as it is for grown-ups in a workplace.

The lamps do not have to be expensive, making it a simple measure available to most – to alleviate a major challenge.

Lighting is a combination of the natural and the artificial. Experiences from Frederiksbjerg School in Aarhus add to the knowledge about how light affects learning, and to the understanding that lighting does not just illuminate a room, it affects behaviour.

SOURCES

- The study: «Noise measurements during focus-based classroom activities as an indication of student's learning with ambient and focused artificial light distribution», Imke Wies van Mil, Baltazar Brière, Cheol-Ho Jeong, Olga Popovic Larsen, Anne Iversen, Finnur Pind.
- Danish Association of Architectural Firms (www.danskeark.com)
- The independent, Danish website "Skolemonitor" (https://skoleliv.dk), focusing on school politics and development, among other issues. Part of the JP/Politiken's Publishing House.
- The Danish portal on indoor climate "Indeklimaportalen" (https://www.indeklimaportalen.dk)

Universal design from day one

The school and kindergarten are at the heart of Ydalir, a new district developing in Elverum. Universal design has been a defining factor from the start.

"THE BEST THING about Ydalir School?" Margrete Hangård (11) bounces down from the slackline in the school yard.

"There is so much space. You can just go off on your own if you need to think", she smiles.

The 7th grader used to go to another school in Elverum but she is glad she changed to Ydalir. "My friend thinks my school looks like a luxury hotel, so I feel very lucky to come here."

A GROWING COMMUNITY

Ydalir is the name of the school, kindergarten and new district on the east side of Glomma river and Elverum city centre. The name comes from Norse mythology, and refers to the place where the god Ull resided in the outskirts of Åsgård, home to all Norse gods.

There are still just a few buildings on the large plots, but over time, a thousand flats will be built in the area. The school, kindergarten and the sports hall were the first buildings to be finished, in the Autumn of 2019. The school has capacity for 350 children, the kindergarten for 140.

Focus on universal design from the start has been beneficial to the Municipality of

ON A SLACKLINE: Margrete Hangård (11) enjoys going to Ydalir school, where there is so much fun to be had in break time.

LEAPS AND BOUNCES: Anton Gunnersrød Løvholm (5) boings up the rainbow hill in Ydalir kindergarten.

Elverum, according to Erik Skari, unit manager at the Planning and Property Department. The municipality's goal is for all public buildings to be universally designed by 2025.

The vision is clear: Build for everyone, adjust to the individual, with added value for society at large.

"This area used to be a gravel quarry. We had the best starting point for building a school and a kindergarten suitable for everyone", says Hans Erik Skari.

The Headmaster at Ydalir School, Monica Bekkelien, used to work as a Development Manager in the municipality. She was part of the engineering of the new facility, with a budget of approximately 400 million Norwegian kroner.

LIVING THE DREAM

"First, I had the opportunity to take part in building my pedagogic dream, now I get to live that dream," she says and laughs.

"My dream is a school where the children can move, learn and explore. Whether you crawl, as in the kindergarten, walk or wheel," Bekkelien says.

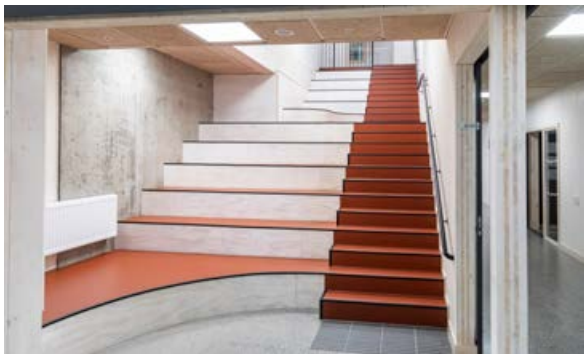
The school, the kindergarten and the outside space are designed to be accessible to all, regardless of functional ability.

"I see it every day; kids in wheelchairs have no problem getting around the buildings and into school. All entry points are made to roll through easily. Even though the school has two floors, all classrooms are entered from ground level. Openness and accessibility are some of the things we are most pleased with. That has been one of the benefits of working with a landscape architect from the start," she says.

Inside the school the special education rooms, such as the music room, library, woodwork, design and technology, are co-located

BENCH WITH TWO LEVELS: Kids and adults can make pancakes together in Ydalir kindergarten. The kitchen island is the right height for kindergarten teacher Stine Merete Johansen on one side and, using steps, for Anton Gunnersrud Løvholm and Lene Aurora Stolp Olsen on the other side

MULTI FUNCTION: The staircase has a dual function as seating and a meeting place. Steps, landings and handrails are marked in contrasting colours.



TOTALLY ZEN

Hans Erik Skari describes Ydalir as the Municipality of Elverum's most ambitious project.

"We have built for the future," he says.

The whole district is built as a ZEN project, which in this context does not mean an eastern religion, but a "Zero Emission Neighbourhood" – a multidisciplinary science project directed by the Norwegian University of Science and Technology (NTNU).

All buildings in Ydalir will be of passive house standard or better, using building materials that emit a minimum of greenhouse gases.

at one end of the building, close to the main entrance and right next to the lift. In order to avoid the long corridors outside becoming "dead space", these areas have been made into "rooms within rooms". Benches and seating are built along the walls, where the children can sit and read, play games or just 'hang out'.

"The corridors are so wide that it is possible to pass one another, whether you are sitting, standing or walking. Here, it is even allowed to run in the corridors!" says Monica Bekkelien.

NO NOISE

Ydalir School and kindergarten are built with cross laminated timber (CLT), which is beneficial for both the Earth's climate and the indoor climate. At the same time the wood contributes to ensuring good acoustics.

"The acoustics here are magic" says Monika Bekkelien.

”Several of the teachers here used to suffer from headaches caused by noise when working in other schools. Since moving here, the headaches have ceased. And the children at Ydalir are no quieter than children elsewhere.”

The Headmaster smiles. She emphasizes that the good acoustics are due to the use of wood throughout the building. As well as CLT in the main construction. Wood is also used in the interior. All the walls in teaching rooms and communal spaces are lined with sound-absorbing wooden slats.

“The size of the classrooms is similar to other schools, about 60 square meters, and we, too, have conflicts and children with challenging behaviour. But something happens in these rooms. You don’t need to shout to be heard. Even in the large sports hall, where we have a full sized handball court, two people can stand at either end of the hall and talk to each other.”

So far, a hearing loop has only been installed in the sports hall, but there are plans to extend loops to the entire school. So far there are no pupils who have hearing impairments, but all is set for installing hearing loops in the classrooms when needed.

UP IN THE TREES

Outside the science lab on the second floor, there is a ’tree house’. It is used for outdoor science education. Science is a core subject in the school.

“Being a science teacher myself, I’m concerned with science not being just another subject at school, but an experience,” Monica Bekkelien says.

”The facilities are not going to waste when the school and kindergarten close in the afternoon. We hope this will be a meeting place for the entire district and the surrounding area.”

Monica Bekkelien

SMOOTH TRANSITIONS: Wheeling to the kindergarten entrance or the benches, often used as a meeting place, is no problem.

ACOUSTICS FOR CHILDREN AND ADULTS: Headmaster Monica Bekkelien doesn't need to shout. Widespread use of wood and acoustic slats on walls and in the ceiling creates good acoustics for employees and pupils at Ydalir.

OUTDOOR SCHOOL: Hans Erik Skari at the Municipality of Elverum, and Headmaster Monica Bekkelien are in the 'tree house', built as an extension to the science lab. Here, the children will learn science in the open air. The teaching modules, which will replace normal desks, are on their way.

"Nature must be brought into the science lab and the science lab brought back into nature. It is important that the children understand the connection between nature and what is happening around them. For example, why is there more water in the Glomma River and increased danger of flooding."

The 'tree house' is accessible by a staircase from the school yard or across a small bridge from the science lab. Children in wheelchairs can take the bridge across, which goes out from next to the lift.

One part of the building, where the sports hall is located, also serves as a community hall. The premises can be used by clubs and community groups. The outside area is already a popular meeting place after school. Smaller children play on the playground equipment and older children play ball. There are enthusiasts on roller skis and outside fitness classes for seniors.

"The facilities are not going to waste when the school and kindergarten close in the afternoon. We hope this will be a meeting place for the entire district and the surrounding areas," Monica Bekkelien stresses.

HAPPY AT PLAY: The kids have taken over the new Maristien Kindergarten in Porsgrunn, on the same plot where Frednes Kindergarten burned down.

A fresh start on the fire site

Four years after the old kindergarten burned to the ground, the new Maristien Kindergarten in Porsgrunn has opened its doors to 120 children. There is plenty of space for all children, regardless of functional ability.

"IN MARISTIEN WE HAVE a large and unique professional environment in modern surroundings", says Head Teacher Anne Omnes.

In the autumn of 2020, the countdown was finally over. The doors opened for excited children, parents and employees in the brand new premises, with a total of eight toddler and big children's units, plus a special unit.

DRAMATIC FIRE

Maristien Kindergarten replaces the old Frednes Kindergarten, which burned down in May 2016. "The old kindergarten was built in the early 1980s, and was cramped for space. We had just had an extensive upgrade of the changing rooms, and we were hours away from using them for the first time when the fire broke out", says Anne Omnes.

The day's activities were in full swing when the fire started, but luckily no one was injured. The fire was quickly detected and children and staff were evacuated. But the building could not be saved.

"The children remained calm; they were used to participating in fire drills. But it was a terrible sight to see the flames coming out of the kindergarten."

Fire drills are also planned in Maristien Kindergarten, but otherwise not much is reminiscent of the old premises. The new building of around 1800 m2 cost just over 80 million Norwegian kroner. In addition to the kindergarten units, there is a large meeting room with an amphitheatre, which can also be used by the local community.

SPACIOUS INVESTMENT

The special unit accommodates children who need extra support and close adult supervision. There is room for five or six children, depending on their needs.

The children in the special unit have different, often complex, functional challenges, and most of them need one-on-one adult care. Viola Hegna, Head Teacher at the Rainbow Special Unit at Heistad School, has been involved in the design of the new special unit in Maristien. One focus has been to build a big enough space.

"Too many special units are small and cramped", she says.

"Maristien has the advantage of having plenty of space, for children, adults, and all the technical equipment. These children often need a lot of space-consuming aids", she says.

INTERACTION

The special unit is equipped with a sensory room, computer room and an activity room. Head Teacher Anne Omnes emphasises that the kindergarten encourages close collaboration between the units.

"Integration is one of the design principles behind this building. As long as the children in the special unit are able to do so, they can participate in joint activities. And the children in the other units can use facilities such as the sensory room", she says.

In the ordinary toddler and big children's units, children with major or minor disabilities also attend. The new premises are universally designed. There is stepless access to the kindergarten, and communal rooms, such as the assembly hall and amphitheatre, are located on the ground floor.

GOOD ACOUSTICS

Extensive use of wood, including wooden pillars on all walls, is good for both indoor climate and sound quality.

"Good sound quality is especially important in a large building like Maristien, where many people are gathered in the same place, for hours on end", says Anne Omnes, adding:

"For children who are hearing-impaired, or who become stressed and restless due to loud noises, it is crucial. It is also important for everyone who works here, to avoid sick leave and absence due to, for example, headaches. It is important for the health of us all."

EASY TO FIND THEIR WAY: Clear contrasts and markings in the new kindergarten premises.

”Integration is one of the design principles behind this building.”

Anne Omnes

INCLUSIVE ENVIRONMENT: Viola Hegna (left) and Anne Omnes are happy to welcome children, parents and staff to a kindergarten designed to accommodate everyone, regardless of functional ability.

IMPORTANT AIDS: In the bathroom of the special unit there is a practical shower bed and lift, which helps with the many heavy lifts. Viola Hegna explains that there is space to push the shower bed out from the wall to get to both sides.

SMART SOLUTION: The sandbox is raised and stands on legs, with a rounded base, making it easy for children in wheelchairs to move up to it and join in the play.

One student changed everything

One student's needs prompted changes benefiting the whole school.

IN A NEW LIGHT: Improved illumination in the group room benefits both Mangus and his teacher Marthe Eriksen Bolland.

NEW PERSPECTIVE: “The process gave us a new perspective on our school. We knew that it needed an upgrade, but when we were asked why, we saw it with new eyes”, says occupational therapy specialist Lillian Åldstedt and Department Head Torbjørn Langaas Lien.

PEDER WAS SEVERELY VISUALLY IMPAIRED, when in 2014 he was admitted to Dalgård School and Resource Centre at Byåsen in Trondheim. Built in 1978, the local school had for years been in serious need for an upgrade. It was only when Peder’s needs were identified that things really started to happen – and to a much greater extent than the school had ever envisioned.

PERMANENT MEMORIES

Peder had a much better life at school after the upgrade. But tragically, in 2018, he died in an accident. On his desk is a picture, candles and greetings from the other students. But Peder’s schoolmates have more than just fond memories of their classmate. His contribution to the design of the school has provided something concrete and lasting. Everyone at the school now enjoys better light, sound and accessibility.

“The first thing we did was talk to Peder. We took him for a walk around the school and asked him what he thought could be improved”, says Lillian Åldstedt. She is an occupational therapist specialising in children’s health at Dalgård School and Resource Centre.

“I especially remember that he said that IKEA has orientation lines that you can follow. The lift was not marked at all, some of the stairs were tricky, and there was a general lack of marking and lighting of columns and glass surfaces. Besides, parts of the school were very dark”, remembers Ålstedt.

EXPERT ASSISTANCE

Tambartun Competence Centre (now Statped Midt) was contacted for advice and guidance.

“Peder wanted to be as self-sufficient as possible; he was the type who believed that other people were in greater need of help. He did, however, spend a lot of energy compensating for his impaired vision, finding his way around. Tambartun stressed that this energy should rather be used for learning. Looking at it from that perspective, it was very clear to us that we had a big job to do”, says Peder’s teacher, Marthe Eriksen Bolland.

Peder’s needs became the key to obtaining the necessary funding:

“We came up with the idea of applying for funding, administered by the Chief Officer. This fund is intended for students with special needs after a professional assessment. My first thought was that it is unusual to apply for funding based on one student, when it benefits the whole school. But eventually we looked at it from the

EASY ACCESS: With underground heating all the way from the taxi rank to the entrances, it is easy for Magnus and his schoolmates to get around in the winter.

DALGÅRD SCHOOL AND RESOURCE CENTRE

Completed in 1978. Special school until 1998. Since then, it has been a local school and resource centre for the Municipality of Trondheim. The school has about 500 students from the local area. In addition, Dalgård takes in students from the 57 other city schools, 100 students in total. Some of these students are cognitively impaired.

The school has a special education comprehensive offer with interdisciplinary collaboration between teachers, occupational therapists, speech therapists, health and music educators.

The school employs over 140 people, and coordinates a network including four smaller special needs groups located at other schools.

other way around: It's great that everyone benefits", says Torbjørn Langaas Lien, Department Head at Dalgård School and Resource Centre.

KEY PERSON

A report, based on Tambartun's recommendations for a number of improvements, became a central document in the application process. The project was prioritised via a key person in the municipality, Solveig Dale. She is Universal Design Adviser in the Municipality of Trondheim.

"With expert statements from Tambartun, and the municipality's key person on board, the process started to roll", says Langaas Lien.

FINAL BREAKTHROUGH

Dalgård School and Resource Centre could finally build something it had wanted for 15 years: a heated pathway from the taxi rank to the school entrance. Previously, the visually impaired student had a hard time orientating himself in winter, as everything was snow-white. The

SHOWING THE WAY: The orientation lines are helpful for the first graders when lining up and finding their way around the large school building.

heated pathway was just one of many measures implemented.

Outdoors, signs have been put up, so that everyone knows where to go. Previously, both students and parents struggled to find the right rooms. In the corridors, orientation lines have been put up – throughout the school.

BIGGER FOCUS

"In the beginning we focused on the areas where Peder moved the most, such as classrooms and surrounding areas. But along the way, our understanding changed", Langaas Lien explains. Peder should be able to use the whole school. He should be able to get to the home economics room, to the arts and crafts room, to the sensory room and the gym.

"We insisted that all areas at the resource centre are learning spaces. A changing room isn't just a changing room. It is also a learning space", the trio explains, leading the way into a well-lit room.

In the past, it was far too dark. The assessment uncovered the need for upgraded lighting in a number of areas – in group rooms, hallways, and on the way to the swimming pool. Now, LED lights are fitted with a completely different illuminance than those used previously.

HOME DESIGN: It was a challenge to find the right pictogram for the activity room. Lillian Åldstedt, occupational therapist specialising in children's health, solved it by designing it herself.

FINDS HIS WAY: Magnus quickly finds his way around the school kitchen thanks to clear markings on drawers and cabinets.

ACOUSTICS

The swimming pool itself has been improved in terms of acoustics.

"Acoustics are important for students who are visually impaired. You become very dependent on hearing when you cannot see. If the acoustics are bad, the situation is even more demanding", explains occupational therapy specialist Åldstedt.

Torbjørn Langaas Lien lifts the white plastic gratings along the pool edge. Below is the solution: Slanted plastic hoops are mounted all around. They lead the water in a different way, significantly reducing the sound of loud splashes.

At the bottom of the pool, the start and end

“Acoustics are important for students who are visually impaired. You become very dependent on hearing when you cannot see.”

Lillian Åldstedt

of the ramp are marked with dark tiles in contrast to light ones. Direction is also marked in the same way with tiles at the bottom.

Along the edge are clear markings in the form of contrast and use of different types of tiles.

FINDING YOUR WAY

In the corridors, columns are marked with black and yellow stripes. Large steel doors – which occasionally are left wide open and protrude into the walkway – have been given similar markings at the ends. Each learning room is clearly marked with tactile pictograms, placed at a readable height.

In addition to clear markings of the doors, the contents of all drawers and cabinets in the special rooms are also marked with pictograms.

“If you are told to go to the drawer and get a whisk, for example, you will find it via the signs. The feeling of empowerment, and of independence, is important when you want to manage most things yourself”, says teacher Marthe Eriksen Bolland.

The old wooden kitchen tables and benches have been replaced by adjustable tables with easy access for wheelchair users. In the hallways, all glass surfaces have been given a frosted area with figures on it. Outside, LED lights are mounted under the roof along the entire school, so it is easy to find your way.

“Many of our students have difficulties with concentration and attention. When you feel that you are safe at your school, you can breathe easier. It influences your whole learning environment”, says the trio at Dalgård.

Peder’s story is told with the permission of his parents.

LEFT HIS MARK: Peder died in an accident. His contribution to the design of the school has left something concrete and lasting: Everyone enjoys better sound, light and accessibility.

OUTDOOR SPACES

NEW OASIS: Kolstad Kindergarten opened in August 2020. The outdoor area is varied and accessible to all.

MULTIFUNCTIONAL: The lush tunnel is fun, but also a point for orientation, according to Solveig Dale.

A lush and colourful oasis

Brand new Kolstad Kindergarten boasts an easily accessible outdoor area, designed as an inspiring oasis for fun and play.

A KITCHEN GARDEN, a tunnel made of braided willow, colourful hopscotch scattered between winding paths.

"This outdoor area inspires play that stimulates the senses, and it is accessible to all," says Solveig Dale, Universal Design Adviser in the Municipality of Trondheim.

DIFFERENT ZONES

The outdoor area is divided into zones that can be explored. The oasis fans out from the kindergarten entrances, cutting across gentle slopes.

"The paths are covered by asphalt; cobblestones mark the stepless transition to other materials: Artificial grass, regular grass and rubber surfaces – creating clear contrasts between play zones and walking areas," explains Dale, and shares a useful tip:

"If you squint, you get a sense of the contrasts".

"The use of different materials also ensures the necessary tactility and provides orientation lines for visually impaired people," Dale says, adding that natural orientation lines increasingly replace artificial ones.

"Universal design is now a natural part of the planning."

COMPREHENSIVE DEVELOPMENT

The new kindergarten is part of a comprehensive development plan for the Saupstad-Kolstad area.

"Saupstad-Kolstad is one of three pilots in the age-friendly community project. The development plans are all about enhancing functionality in key projects, even kindergartens. With an accessible outdoor area, the kindergarten also serves as an important meeting place after hours," explains Dale.

TACTILE AND VISUAL

The area in front of the entrance is covered in wood. Two rows of cobblestones mark the

"The use of different materials also ensures the necessary tactility and provides orientation lines for visually impaired people."

Solveig Dale

DIFFERENT MATERIALS: Rubber cover, asphalt, artificial grass, natural grass and cobblestones mark clear zones, making it easy to orientate.

CONTRASTS: The combination of sand, rock, rubber and wood creates natural orientation lines.

stepless transition to the asphalt covered walking path. In front of the door, there is a scraper grid serving a dual purpose: it removes dirt from shoes and provides tactile-visual markings for visually impaired people.

Underneath an eave above the entrance, there is a fixed seating group. There is room for wheelchairs at either side of the table. A play table nearby is also accessible to wheelchairs.

"The entrance to the play table is wide and covered with gravel firm enough for wheels to turn easily. Wheelchair users can get close and play with others on equal terms," says Dale.

The outdoor area also has an amphitheatre with seating on three levels. Wheelchair users can sit either on the top or bottom levels, in front of the regular seating.

"The ideal would be to make an indent into the bottom seating area, so that wheelchair users can sit next to the others," Dale says, adding:

"This can be easily corrected."

NATURAL ELEMENTS

A large rock, a row of small tree stumps and logs are incorporated into the outdoor play area.

"They enhance creative and free play, as well as provide crucial tactility."

A small mound for climbing is perforated with tunnels.

"To crawl through one of these, be inside, get out, feel the excitement and safety, is stimulating," says Dale, drawing attention to the ball wall: The tall wooden wall is perforated at different heights, inviting everyone to play. There is also a slide, with sturdy, turquoise rope handrails leading to the top. Nearby, there is a long, bright and lush braided willow tunnel.

"A beautiful element for orientation," says Solveig Dale.

All in all, the outdoor areas invite everyone to join the fun and games, regardless of functional ability.

HOPSCOTCH: A colourful hopscotch for fun and action.

ROLEPLAY: The various zones invite roleplay.

Cork replaced rubber

The playground surface in Askeveien Kindergarten in Oslo is covered by cork, not rubber – the first of its kind in Norway.

"WE ARE EXCITED TO FIND out how it works out in the long run", says Jan Tore Lindskog, senior adviser at the Municipal Undertaking for Social Service Buildings in the City of Oslo.

One year after a study trip to Stockholm, the pilot project became a reality. The summer of 2020, the playground in the brand new kindergarten was covered with cork. Now, the children in Askeveien Kindergarten are tumbling around on soft, natural-coloured cork instead of colourful rubber.

"Cork has been used in several other locations in the country, but this is the first time it is being tried out in a kindergarten", explains Lindskog.

PILOT PROJECT

Neither sand nor bark is suitable for a walking

PILOT PROJECT: Askeveien kindergarten in Oslo has cork instead of rubber surfaces.

aid or wheelchair. Some years ago, rubber surfaces were introduced in kindergartens and schools. First in the form of rubber mats.

"Eventually, the mats were replaced by fixed rubber surfaces that were more in line with universal design", says Lindskog, adding:

"Although rubber is a natural material, it is not environmentally-friendly. That is why we went to Stockholm to learn more, in collaboration with the Municipality of Follo. In Stockholm, using cork for playground surfaces is relatively new, but they are one step ahead of us. We eventually decided to give it a try."

SAME PROCEDURE

Cork cover consists of processed bark. It complies with EU regulations for surfaces designed to cushion falls. It also complies with Norwegian regulations on playground equipment safety and universal design requirements in Regulations on Technical Requirements for Construction Works (Tek17).

Requirements include adequate drainage and that the cover keeps its shock-absorbing qualities in winter.

Minor damages can be repaired on the spot, and the entire cover can be recycled. Cork surfaces last five to ten years, and consist of 90 % cork and 10 % glue (polyurethane).

Installation follows the same procedure as traditional rubber: Glue is added to bags of cork in a mixer, then poured into a wheelbarrow and distributed, first a bottom layer, then a top layer. Drop height determines the thickness.

A traditional rubber surface has a guaranteed life-span of up to ten years.

"The durability of a rubber surface is determined by how it has been installed. For instance, to avoid chipping, it needs an edge," explains Lindskog.

DURABLE OR NOT?

The kindergarten has about 100 square metres of cork surfaces. Lindskog looks forward to finding out how long they will last.

"We don't know exactly how cork reacts to our climate, but experiences from South Korea are promising."

The plan was to conduct research on the new cork surfaces, and monitor maintenance, durability and the development of children's motor skills. Unfortunately, the application was rejected.

"Now, we are looking for other ways to finance the research," says Jan Tore Lindskog, adding that the City of Oslo aims to spearhead environmentally-friendly development.

In harmony with nature

Askeveien Kindergarten is situated on historic grounds in Oslo, with an outdoor area where nature plays an important part.

DUAL PURPOSE: White circles for play and wayfinding.

ORGANICALLY SHAPED playground equipment made of solid wood, a wooden horse in the sandbox, cork surfaces, a slide embedded in a slope and trees providing natural shading: Askeveien Kindergarten is the opposite of the regular colourful playgrounds.

Askeveien 7 used to be a private property with a listed residential building. The house was bought by the Municipal Undertaking for Social Service Buildings. The plot was converted to kindergarten use, and expanded through the acquisition of the next door plot.

Previously, the entire property was listed due to the discovery of cultural heritage remains from the Iron Age. When the property was rezoned in 2007, an archeological survey was carried

NATURAL ORIENTATION LINES: A combination of cobblestones, asphalt and grass creates contrasts and natural orientation lines.

out and The Cultural Heritage Office in Oslo revoked the overall protection status.

FROM WILDERNESS TO OASIS

The kindergarten opened the summer of 2020. Where there used to be an overground wilderness with a derelict greenhouse, children are now playing in various zones. Two kindergartens are located on the same plot, just a stones throw apart. To the left is an old, tall and listed city villa, rehabilitated in 2009 and turned into a kindergarten.

The listed status made it impossible to fully adapt the villa to a universal standard. Next to the villa is a low-key new building, almost completely absorbed by the large trees that surround it. Together, the two buildings are Askeveien Kindergarten, with a common outdoor area.

"What makes this place special, is that the old building and parts of the garden are still listed," explains Odd Ivar Werner, who was project manager for the build at the Municipal Undertaking for Social Service Buildings in the City of Oslo.

SPECIAL CONSIDERATIONS

The outdoor areas of two plots have been joined together, with special consideration for the partially listed status.

"For instance, the trees are of high conservation value and cannot be removed without a permit. However, some of them were damaged; others needed to be removed to make room for the construction. Each tree that was removed was replaced by a new one," Werner explains.

Werner and his colleague, Senior Universal Design Adviser Jan Tore Lindskog, are showing us around the premises, accompanied by the sound of children playing. Lindskog points to a path across the lawn, covered by fine gravel.

"The path crosses a protected area, and in collaboration with The Cultural Heritage Office

ONE, TWO, T(H)REE: Alle playground equipment is made of wood, as are the fences.

WOOD AND CORK: Everyone can access the wooden playground equipment. The surface is made of cork.

ROLEPLAY: The many accessible zones invite roleplay.

in Oslo we decided on this cover. After a while, it will become firmer and easy to use for wheelchairs and prams," says Lindskog.

The diagonal path is a shortcut, as young and old alike tend to choose the shortest route from A to B.

NATURAL ORIENTATION LINES

Between the dark asphalt and the green grass lies a row of cobblestones.

"This solution has many advantages: It keeps the grass in place and simplifies maintenance. But most importantly: The combination

provides contrasts, making it easy to orientate," say Werner and Lindskog.

"The natural materials create natural orientation lines, a better solution than constructing artificial ones," according to the duo.

White circles of different sizes have been painted on the asphalt, inviting play but also serving as orientation spots for children with visual impairment.

NATURAL MATERIALS

Natural materials characterise the entire outdoor area. All climbers, swings and balancing equipment are made of wood.

"Here, the equipment is so low that grass is adequate to cushion falls," says Werner and points to the logs and rough rope designed for balancing.

Wheelchairs have easy access to all playground equipment, and the different zones invite children to play together.

"That is essential," says Lindskog.

The newly constructed kindergarten has two entrances.

"The access from the parking lot into the second floor, and from the pavement into the first floor, are both universally designed. The topography of the plot made the gradient to the first floor a bit of a challenge," explains Werner.

In addition, there were trees that could not be removed due to their listed status. The solution was a curved walking path, gently sloping from the entrance to the pavement – preserving the magnificent trees from the old villa property.

INVITES ROLEPLAY

Trude Hoel, Head Teacher in the kindergarten, is immensely pleased with the outdoor area.

CREATIVE KICK: Natural materials make children more creative and adventurous, according to Trine Haugseth Kollstrøm and Trude Hoel.

"The standard playground equipment, with tall climbers, a slide and a sandbox, don't always offer enough challenges. With the kinds of materials we have here, we observe different forms of play. The children are a lot more creative and adventurous."

Trine Haugseth Kollstrøm agrees. She is Head Teacher at Casinetto Kindergarten, which uses Askeveien while Casinetto is being rehabilitated.

"The combination of trees, cork, wood, rock and grass creates nice transitions and constitutes a small oasis. The area appeals to the children, with unifying spots where they play well together," Haugseth Kollstrøm says.

The two head teachers have observed that the outdoor playground invites roleplay.

"That is perhaps the most important thing children do. Roleplay is extremely important to the creative, cognitive and social interaction. And everyone can join in."

A school block for the future

In the town of Sortland in Northern Norway, three schools are connected by a universally designed shared outdoor space.

"IT HAS BECOME A NATURAL meeting place for people in the area. It is safe for the children and social for everyone," says Grete Angelteveit. She is enjoying the fine weather and her parental leave with her friend Jannet Olsen. The new mothers have no problem maneuvering their prams through the school block.

BENCHMARK PROJECT

The area was a benchmark project when Sortland was appointed role model municipality for universal design by the government in 2008. The goal of the school block project was to enhance the universal design competence of everyone involved, and serve as a good example to the entire region.

Today, it is a popular urban space for everyone in town. The swimming pool, the sports hall and the town's three schools – primary school, middle school and upper secondary school – are all located here.

Project Coordinator Kristine Røiri in the Municipality of Sortland explains that it made sense to treat several projects as one: The municipality planned to build a new middle school, the County of Nordland planned to rehabilitate and build a new upper secondary school, and in addition, the municipality wanted to rehabilitate the outdoor area.

OPENED UP

The upper secondary school was finished in 2011, the middle school in 2012 and the outdoor area in 2014.

The large, common outdoor space between the schools now serves as a local hub for walking and bicycle paths.

Previously, the area was dominated by stairs and fences surrounding the individual schools. Kristine Røiri explains that it was important to remove the barriers in order to make the area accessible to all:

"Most people won't cross a schoolyard, unless they belong to the school, so people used to take a detour around the buildings, even if it made more sense to walk straight across."

"Most people won't cross a school yard, unless they belong to the school, so people used to take a detour around the buildings, even if it made more sense to walk straight across."

Kristin Røiri

NO BARRIERS: Grete Angeltveit and Jannet Olsen often stroll through the school block with their prams.

Now, with walking and bicycle paths criss-crossing the area, people make use of the whole space.

"We assessed the existing terrain against universal design in the strictest sense. However, it would lead to major changes to the terrain and substantial detours. In collaboration with wheelchair users, we came up with a good solution: In some areas, the incline is more than the required 1:10, but no more than a modern motorised wheelchair can handle. There are alternative routes for those who need it," explains Rørli.

FRESH FUNDS

There is a bench every 50 metre along the walking paths. At the high end of the area, there is a football pitch, which is iced during the winter, a basketball court, a sand volleyball court, ping-pong tables and skateboard ramps.

Universal design was a basic premise for all developments, which triggered 5,4 million NOK in local development grants in 2011.

Kristine Røiri describes the school block as a solid and good project. It was built according to the former Regulations on technical requirements for construction works (Tek-07). However, it is still an outdoor space standing the test of time, as it was constructed in line with even stricter municipal standards.

A safe school journey for Solveig

Solveig is visually impaired. She can only see bright colours and light. Still, the second-grader can walk to school alone, thanks to a universally designed school path.

WELL, NOT QUITE YET. At seven, she is still too young to walk the three kilometres alone. But as she grows older, she can walk to the local primary school, middle school as well as upper secondary school unaided.

All thanks to constructive collaboration between the Municipality of Vadsø in Northern-Norway, Norwegian Support System for Special Needs Education(Statped), The Norwegian Association of the Blind and Partially Sighted and Solveig's parents.

The Norwegian Broadcasting Corporation (NRK) first told the story about Solveig's universally designed path to school, which was up and running for the first day of school in August 2020. Previously, the path to her kindergarten had been adapted. The primary school is situated a bit further down the road, as is the middle school and the upper secondary school.
This has all been long in the planning.

SAFE ROAD: Solveig no longer needs to be driven or followed to school. (Photo: Sidsel Vik/NRK)

AN ACCOMMODATING MUNICIPALITY

"From early on, we knew that Solveig was severely visually impaired. We contacted the municipality, the kindergarten, Statped and Educational-Psychological Service (PPT)," says Soveig's mother, Elin G. Larne.

"Solveig has an older brother, and we wanted them to attend the same kindergarten. The Municipality of Vadsø was positive, and the adaptation project started early," explains Larne. First, the kindergarten itself was adapted. The dark pine walls were painted in bright colours. The windows were fitted with sensor-controlled sun screens, to avoid glare. The floors in the common rooms, as well as Solveig's unit, were equipped with orientation lines. Brightly coloured dots on the walls also help orientation. Lighting and sound conditions were improved.

"When your vision is as impaired as Solveig's, you miss out on a lot of information. You need something to help you orientate, to avoid being left in a limbo," explains Elin G. Larne, adding that Solveig is physically active and enjoys exploring.

"She quickly learns new routes and wants to do everything herself, but she needs some basics to do so."

“Even if you are blind, you can do most of the things that others can do. You just need to find your way.”

Elin G. Larne

NEW OUTDOOR AREA

Eventually, the outdoor area of the kindergarten was also adapted.

“It used to be a messy and muddy grassy patch lacking in clear features, making it difficult for Solveig to find her way. There was also a risk that she could fall down from the asphalt edge onto the playground,” remembers Larne.

The Municipality of Vadsø made roads and paths through the outdoor area, clearly marked by bollards so she could find the different play zones. A new bird’s nest swing and playground climber was installed.

“Even if you are blind, you can do most of the things that others can do. You just need to find your way. Play areas that invite children to play together, such as the bird’s nest swing, are important,” according to Larne, who emphasises the importance of freedom.

FREEDOM: When she is older, Solveig will be able to walk to school on her own. “That freedom is extremely important,” her mother Elin G. Larne says. (Photo: Sidsel Vik/NRK)

“Without a safe area to play, we could not have given Solveig this freedom.”

SAFE SCHOOL PATH

Now, the path to her school has been equally adapted. The municipality has mainly used existing gravel paths. Solveig’s path to school passes her family home to a walking path with bright red bollards. By touching the bollards with her mobility cane, Solveig can count her way to school.

When she reaches the road, she can continue safely along a new pavement. There are orientation lines – made of concrete slabs with grooves – along the entire school path.

Solveig has to cross a road at a junction where the speed limit increases from 30 to 60 kilometres an hour. The crossing does not have traffic lights, but was fitted with a SeeMe system: Sensors warn cars when a pedestrian is about to cross. In addition, the junction has been adjusted to give drivers and pedestrians a better overview.

USEFUL TO MANY

Solveig’s mother praises everyone involved. She believes such collaboration is rare. In Norway, children have the right to go to the local school. Thanks to universal design, Solveig can walk to school on her own when she is old enough.

“For her to do so, everything needs to be in place now, because it takes practice,” says Larne. She believes Solveig’s adapted school path will be useful to many.

“Many children use the same path, which has become safer for everyone. And this is not just about children: The proportion of older people in society is increasing. At some point in our lives, this may benefit us all. By facilitating mobility – regardless of functional ability – more people can be active longer,” Larne points out. Rita Bakke is a learning disability nurse and mobility educator in Educational-Psychological Service (PPT) in the Municipality of Vadsø. She was key to the school path project.

“To begin with, we planned to facilitate one child, but the adaptation has benefited many,” Bakke says.

UNUSUAL PROJECT

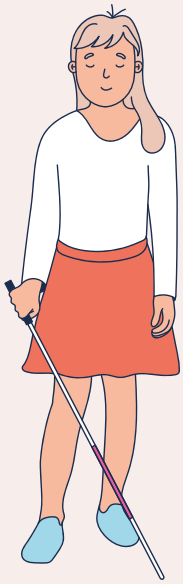
According to The Norwegian Association of the Blind and Partially Sighted, projects like these are unusual. Like Elin G. Larne, Rita Bakke emphasises that teamwork is a prerequisite for success.

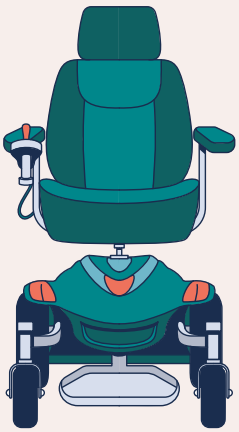
“Solveig’s parents were not afraid to point out needs, and they argued well. Everyone was eager to make this happen,” according to Bakke.

Now, Solveig is getting used to her school path, bit by bit. The price tag for the 2,5 kilometer long school path was 1.6 million Norwegian kroner, which was split between the Norwegian Public Roads Administration, Finnmark County and the Municipality of Vadsø.

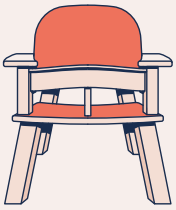
“When the parents made the request, it was natural for us to contribute to a solution,” says Yngvar Mæklæ, Head of the planning, environment and municipal engineering unit in the Municipality of Vadsø.

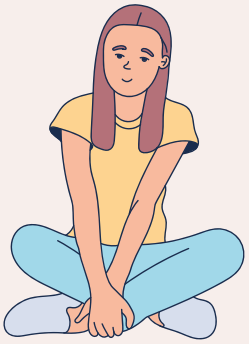
As the adaptation of the school path is a first, the municipality does not have experience with how it will all work out in the winter. The municipality needs to find a solution for removing snow, without damaging orientation lines and bollards.

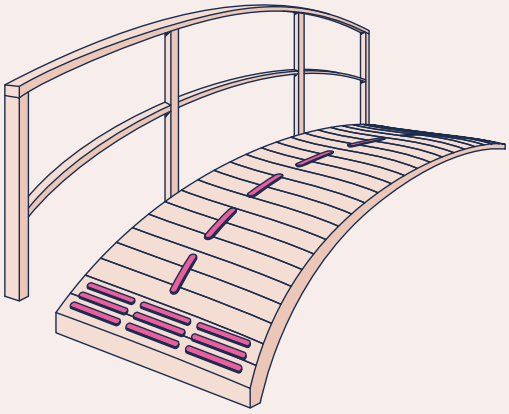


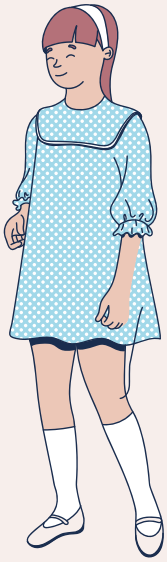


EXPLORING UNIVERSAL DESIGN









No man is an island

Universal design can create a sense of community. No man is an island, according to architect Camilla Ryhl.

SHE IS HEAD OF RESEARCH and development at the Bevica Foundation in Denmark, and author of the book Inkluderende Arkitektur (Inclusive Architecture).

One single solution cannot – and need not – accommodate everything. We need a variety of solutions that combined include everyone and provide freedom of choice, writes Camilla Ryhl in her book from 2017, written in collaboration with her professional sparring partner and Senior Research Scientist at SINTEF in Norway, Karin Høyland.

The idea of the book is to inspire a dialogue about different aspects of universal design in society.

"The concept of universal design is often interpreted as equal to building regulations, focussing on technical and prescriptive requi-

rements. However, meeting the basic legislative requirements for a building is not enough when it comes to securing an inclusive architecture for everyone regardless of abilities. We need to raise the bar and universal design should be at the heart of everything we do," says Ryhl.
She wants to highlight the sensory qualities of architecture, in terms of experiences and participation, and the understanding of architecture as being about the interrelation of body and space.

VISUAL SILENCE

Her research focuses on the encounter between architecture and sensory impairment. Her PhD, Sansernes bolig (Housing for the Senses), made human senses part of the universal design discourse in architecture. It was no longer just about designing stepless entrances or allowing enough space for a wheelchair to turn. Now, the discourse included those who cannot see their own home, people who are born blind.

"What happens to architecture when you remove sight from the equation," she asks, adding that all architects are trained to build visual identity. By removing sight as a yardstick, you need to plan rooms and buildings differently. Tactility, balance, texture, materials and proportions. How a room is discovered, felt and heard. It takes practice to use one's senses, how something feels rather than looks, as a starting point for learning how architecture is experienced.

"It is not enough to get everyone into the room; you need to make sure everyone can stay in the room," Ryhl says.

Universal design is not just about physical accessibility; it is about sight and hearing and all the hidden challenges that are not manifested physically.

The human senses have been a factor in all her research since Ryhl finished her PhD at the Royal Danish Academy – Architecture in Copenhagen.

She has been a senior researcher at the Danish Building Research Institute at Aalborg University (now BUILD) and a professor in universal design at Bergen School of Architecture, and now heads the new Universal Design Hub at the Bevica Foundation. She wants to understand and describe the interaction between people and their physical environment.

NOISE EQUALS LIVELY?

"Acoustics are close to my heart," says Ryhl. 13 to 17 % of the population live with a hearing impairment, experiencing sounds as noise. A big group that is rarely taken into account when designing a building. Ryhl uses hearing as a parameter for accessibility, because at all times, our senses are working together.

> "We need a variety of solutions that combined include everyone and provide freedom of choice."
>
> Camilla Ryhl

How is sound experienced with two people in the room, or with 20 people? Sound is more often taken into account when creating workplaces for adults, less so for children. In a kindergarten or school you need a broader spectrum of sound adapted rooms.

"How do we make sure that we create acoustic zones adapted to children's needs? Solutions should be in place, in fact it should be a matter of course," Ryhl says.

Another aspect to consider is that loud sound is often interpreted as positive, a sign that something is lively. To many, it is unbeara-

> **“If you only focus on minimum standards, architecture cannot unleash its full potential. We have a professional responsibility to raise above minimum standards.”**
>
> Camilla Ryhl

ble, but they choose to stay, even if they will be exhausted the next day or miss out on what is being said.

In schools and kindergartens, visual and nonvisual accessibility govern their entire social lives. Universal design of an institution for children affects the entire family: when they are invited to Christmas pageants or summer parties, when they deliver and pick children up. It frames the family’s ability to participate in a child’s life.

“We need to insist on understanding the full picture, not just categorise people as ‘with’ or ‘without’ functional impairment. Who are we really talking about if we insist on categorising? This affects us all,” says Ryhl.

She believes universal design is about all people, a notion that is not prioritised in architecture and needs to be further explored.

GLASS DOES NOT EQUAL TRANSPARENCY

“These days, in Denmark, we tend to build large schools with many open spaces. Often, glass is translated into openness,” says Ryhl.

She believes this is a result of the Scandinavian way of relating to openness, that everything should be visible.

“That means you will be constantly distracted! I never understood the need for so much glass. Glass should not be mistaken for transparency. Why does everyone have to be seen all the time,” she asks rhetorically.

Transparency and openness in relation to participation should include feeling safe.

“When you are eight years old, not too tall and perhaps a bit shy, it can feel intimidating to enter a large open space lacking overview.”

Ryhl thinks school planners and architects have become more aware of the different diagnoses that children have.

“If they are sensitive, restless or noisy, it may all just be two sides of the same coin. As it affects all of us, discussing sensory exposure is probably a better approach to quality in a building than designing a large, visually beautiful space.”

What happens to the acoustics there? Some schools have more than 1000 students. According to Ryhl, we need more focus on sensory aspects when building schools and kindergartens. It should be a matter of course in line with stepless entrances to public buildings. We need more focus on the link between sensory stimulation and well-being, our emotional core, which is crucial to create good experiences.

UNDERSTANDING YOUR SURROUNDINGS

To categorise people as abled or disabled is neither constructive nor reflective of the reality of diversity. Ryhl asks instead: How can we discuss

inclusion and exclusion without polarising?

Universal design is all about architectural quality, and the wish to create good design is about all of us.

Ron Mace is the man behind the term 'universal design'. The American architect and educator coined the term in the 1980s. It grew out of frustration with stigmatising terms like 'barrier free' and 'accessibility', solutions targeting only people with functional impairment.

Mace wanted to introduce a design term and a design strategy repealing the idea of 'us' and 'them', and the categorisation of people 'with' or 'without' impairment. Universal design, according to Mace, is about making products and environments user-friendly for all, with no need for special adaptations.

THE NEW NORM

In 1997, the term was consolidated with the introduction of seven design principles, developed by Mace in collaboration with other experts. Universal design became a tool with an impact. Mace was himself a wheelchair user, who wanted to avoid special solutions exposing physical impairment and differences, in order to integrate and highlight what we all have in common.

"His personal, physical experience was crucial," says Ryhl.

"In Norway, universal design has become a political strategy. I know a lot of effort has been made to inform and increase competence among public employees and experts. It takes a lot of knowledge to meet the demands, and more importantly, to surpass them. User participation is also crucial. Without it, universal design is reduced to a circle on a drawing, to indicate the turn radius of a wheelchair."

Camilla Ryhl explains that the reason why she wrote the book Inclusive Architecture, is that although physical requirements are important, you need insight and understanding to fully appreciate what universal design is all about.

"If you only focus on minimum standards, architecture cannot unleash its full potential. We have a professional responsibility to raise above minimum standards," Ryhl says.

A HOUSE FOR THE ENTIRE BODY

Architecture is the physical framework to our lives. As such, it needs more focus. Human bodies, in all their varieties, should be at the heart. Equality is not the same as everyone being the same. Universal design is design for diversity. Some bodies need aid. Some need light. Some need time. Some need calm. Sensory stimulation is also universal design.

"The focus of my Master's degree, which led to my PhD, was challenging," says Ryhl.
Her professors and other architects kept forgetting that sight was not to be part of the experience of a room for the target group; people who were congenitally blind. In our consciousness, architecture is so closely linked to what we see.

"As architects, we spend a lot of time on site visits, observing. We hardly think about it, but to experience the room, we touch the walls. We close our eyes to feel the ambience. We carry out our field studies and observations with all our senses, but we only talk about what we see," Ryhl points out.

The potential for a more physical and sensory approach to the connection between universal design and architecture is closer than you think. All you need is someone to highlight the possibilities and show you the way. And that is what Camilla Ryhl is doing.

> **"Universal design is design for diversity."**
>
> Camilla Ryhl

Children as active citizens

Universal design must be founded on the principles of Human Rights. "We have to ask more frequently: Who are you, and focus less on what is wrong," says Inger Marie Lid.

A PROFESSOR AND LECTURER of citizenship at VID Specialized University, Lid is author of the book *Universell utforming og samfunnsdeltakelse* (Universal design and social participation) published by Cappelen Damm in 2020.

DEMOCRACY AND INCLUSION

"Children have the right to develop the way they are, regardless of their starting point," Lid says.

Universal design is about ethics, not just building regulations. Lid is concerned with understanding universal design from the perspective of human rights, and sees universal design as a tool to achieve justice, participation and thus citizenship.

Having researched the subject for years, she

wants to highlight the interdisciplinary qualities of universal design and through that seek to expand the field of knowledge.

"Universal design is about democratic understanding. It is a fundamental democratic value that everyone is respected as equal citizens of society. Equality and participation for all is a core political goal in Norway. So, how will this goal be reached?" she asks.

Lid emphasises that people with complex needs have experienced, and still experience, being kept out of arenas that are supposed to be communal. The barriers are due to attitudes, material conditions and lack of linguistic accessibility.

BARRIERS MUST BE BROKEN

Why is it that we in today's society have to break barriers in order for everyone to be able to participate?

"From a historical perspective, it is evident that western societies have not valued all people equally. Children, women and disabled people have not been given the opportunity to participate on equal terms in public spaces and in the workplace. When women entered higher education and the workplace in Norway, kindergartens and nursing homes were built in order to meet the care roles that women had filled. A concrete physical change was that female toilets were built at universities and in workplaces."

Political and social change leads to changes in the physical environment. Many public institutions were built at a time when disabled people went to different schools and did not have the opportunity to study for a degree, work or otherwise earn an income. There was an expectation that people who used public spaces, went on public transport and studied at educational institutions did not use any form of physical aids. This is not the case anymore, and systematic work is needed to facilitate access for all.

As Lid says:

"Human beings have access to the world through their physicality."

LOCAL SCHOOL AND COOPERATION

In order to learn to be a citizen it is important to enable diverse interaction from kindergarten and into school. Children are products of their environment – they are formed by their social, material and cultural circumstances.

"Universal design is supposed to facilitate human diversity," Lid says enthusiastically. She points out that children have a statutory right to go to a local school, and to receive an education adapted to their needs. In the past, it was considered that school bridged the gap between childhood and citizenship, while now

children are regarded and treated as fellow citizens from the start.

School and kindergarten focus on children learning to develop as citizens in a rich and diverse community. Lid wishes to highlight that diversity is limitless and encompasses people being different, whilst sharing the common ground of being human.

She explains that school historically has been an arena for segregation. Local schools have not always been made accessible for pupils, teachers, parents and carers who have visual or hearing impairments, use wheelchairs or have other varying levels of functional ability. Within the social sciences, awareness of gender and cultural diversity has been greater than that of disability. There is an urgent need to deepen knowledge and awareness of disability issues.

If access to kindergarten and school in any given area is limited to non-disabled children, diversity is affected. It is by facilitating an accessible interaction between children, regardless of functional ability, cultural affiliation or gender, that children and young people are given the opportunity to develop as citizens, participating in society. Universal design in kindergartens and schools tear down barriers, facilitating children to be players in their own lives and interact with others.

EXPANDING THE FIELD OF KNOWLEDGE

Lid regards universal design as a part of both the UN Convention of the Rights of Persons with Disabilities (CRPD), and as a key principle in the UN Sustainable Development Goals on Quality Education and Good Health and Wellbeing – where no one is excluded.

Defining universal design within this framework has, according to Lid, not had much attention in Norway. It has been interpreted primarily in the context of law and building regulations.

Raising awareness of an ethical perspective on universal design is important both in teacher and kindergarten training, as this subject includes pedagogy, didactics, indoor and outdoor space and buildings, as well as relations between children and young people, which promotes understanding and experience of equality. That is why Lid works to find and strengthen a good interdisciplinary knowledge base, which can support citizenship, human rights and sustainability.

NOT AN ABSTRACTION

Universal design cannot be reduced to a standard, Lid writes in her book. She makes a pedagogical point of emphasising human diversity as a horizon of interpretation. A person who has dementia, one using a wheelchair and a person with partial sight, or a child with Cerebral Palsy, an older person who has reduced hearing, and a student who experiences social anxiety may not have much in common in terms of what design they prefer. Lid's point is that the endless human diversity must not be reduced to an abstraction, to simply "a wheelchair user" or "a blind person".

People with varying levels of cognitive, physical, mental or sensory abilities have very different needs of facilitation. Some need physical aids, others services, and some need help with understanding or cognitive guidance. Disability as a category can therefore be misleading as the needs are so different that they may become invisible inside this category.

Different ways of setting standards may be a pragmatic tool and offer some help, but according to Lid, it is not possible to claim that universal design may be achieved by introducing a standard.

Article 2 of the UN CRPD, says that both products, environment, programmes and services must be universally designed. Everything

created should be possible to use by all, as extensively as possible. In order to succeed with this, Lid emphasises the importance of the development process being interdisciplinary and constantly evolving through systematic evaluation, which in turn will lay the foundation for improved solutions. In this context, it will make sense to use all phases of human life as a starting point.

DEGREES OF FUNCTIONAL ABILITY

One example in the book is a person pushing a pram and a person using a wheelchair. Even though both will enjoy entrances without steps and an even surface, the individual differences are great. The child in a pram is light and will not need to move by itself, whilst the person in a wheelchair may have an adult's weight and need to move independently.

Lid states that accessibility for all cannot be solved by adding different layers of measures on top of each other. Universal design is not the sum of accessibility for several groups of people, but a new way of thinking and a new way of understanding equality in the face of accessibility, based on the fact that people are different. That everyone has the ability to function. It is therefore better to talk about degrees of functionality, rather than seeing it in contrast to an abstract person without reduced functionality.

Lid is engaged and curious on behalf of the subject matter, but she still thinks that a 100 percent accessible society is a utopia. There will always be friction in people's interaction with their surroundings.

"Maybe universal design is best understood as a society for all," she says and adds:

"We have to ask: How and in what way can universal design be a part of promoting the vital interaction between all people?"

Being different is quite normal

“No one should feel awkward or different. There are only different people with different needs,” says Siv Stavem.

SHE IS A SCHOOL PLANNER in a consulting firm, which offers technical solutions, architecture and community planning. Currently, she is also working on her PhD in school planning – an unusual specialty.

Designing school buildings is a complex affair, requiring contributions from several specialities. Stavem is an educator and adviser, and is concerned with what a room can do for students and teachers.

“What uses does a room invite? This is a crucial question to ask, in order to find the best, universal school and kindergarten designs for all,” Stavem says.

FORM TO PURPOSE

When designing products and architecture, the main idea is that form follows function. There

is a purpose to everything made and designed. 'What is the purpose of universal design, and how do we get there?' are the first questions Stavem asks when mapping needs in a new school. Her job as educational adviser is to uncover all the user needs – no small task – and develop minutely detailed plans.

"Consider a wheelchair. We think it's easy, because it's obvious that it needs space," she says.

"However, in an auditorium, wheelchairs are often placed right by the stage, in front of all the chairs, or way in the back, behind the last row. Does that mean we have reached our purpose," she asks, answering her own rhetorical question:

"People in wheelchairs are not seated on equal terms with those who do not need wheelchairs. This is an issue for all functional disabilities, including the invisible ones," she says.

User participation is crucial.

"I will never get the same competence as those who live it. But I can learn which questions to ask and listen when I am on site visits, observing."

QUITE NORMAL

What do children and adolescents need the most in kindergartens and schools? A place to retreat.

"I always try to include spaces where you can be by yourself for a while. This is very important. More people than you think need alone-time during the course of a day. Some need to take medication, others just need not to be social all the time. My point is that you shouldn't need to feel different, whatever your needs are. By saying something is different, and designing accordingly, you also say that some are normal and others are not."

If universal design is to achieve that no one feels different, Stavem believes it is important to convey that being 'different' is actually the norm.

"By saying something is different, and designing accordingly, you also say that some are normal and others are not."

Siv Stavem

DOES IT HAVE TO BE THIS WAY?

She thinks municipalities and counties are good at following the laws and regulations granting kindergarten and school children the right to influence their own workplace, as well as involving users to find good solutions for people with functional impairment. However, there is always room for improvement, and you will always have to compromise, especially when remodelling old school buildings. That is the most challenging task, she says.

Room solutions and outdoor areas in schools and kindergartens are extremely varied. When small children play school, they make desks, chairs and a blackboard, and raise their hands. To them, this is what a school is, their unchallenged expectation of what a classroom looks like. A desk and a chair, the same height for everyone. A basic structure rarely discussed. It should be, according to Stavem.

In a kindergarten, the basis for everything is play, while schools in Norway to a great extent stem from the church tradition, where reading of the bible and catechism used to be at the heart of teaching. The tradition of identical furnishing for every student is strong. When it started, and why it has continued, is rarely questioned when schools are rehabilitated or built.

Even though school buildings differ, the classroom structure has survived more or less intact through the years. Stavem tells the story of a brave teacher in an old school in Kongsvinger, who threw out all desks and chairs from the classroom, replacing them with large bean bags on the floor, low tables and screens.

"You have to challenge old habits, right?"

WHAT USES DOES A ROOM INVITE?

Norway is a small country, and the basis of comparison in the field of schools and education is not particularly extensive. To see our own ways in perspective, it is a good idea to look at how the UK furnish schools. There, it is not necessarily a given that children sit on a chair in the classroom. Desks and chairs are lower, adapted to the children. The floors are considered a flexible space for seating; there are reading corners and a lot more colour than we are used to.

Stavem is currently working on her PhD thesis at the Department of Education, University of Oslo. Her PhD explores exactly this, how schools and classrooms are planned and used. She is researching what uses the physical environment invites and inspires. A classroom full of identical chairs and desks conveys that everyone is the same, with the same needs.

"That is not the case!"

Stavem underlines that her mission is not to look for solutions to invisible or visible physical impairment, but to create a classroom environment reflecting that everyone is different. Especially in middle school, all you want to do is fit in. Stavem knows from experience that many adolescents need time and space to be alone, but if their choice is obvious to all, they often choose not to retreat.

"In some schools, the only way to get some peace is to lock yourself into the toilet. That is why it is important to create room for retreat, design schools that counter exclusion, physical as well as mental, regardless of preferences, diagnosis or functional ability. Designing schools and kindergartens universally, by facilitating for the individual and regarding all people as different with unique needs, creates equality."

CONVENTION AND INNOVATION

As an educational adviser in school planning, you operate in a field of tension between convention and innovation. The physical environment is closely linked to habits that affect learning in kindergartens and schools. Most of us will use the furniture in a room as is, even if we would like it to be different. We forget that we can choose what controls us.

"The most difficult aspect of my job is to describe the educational purpose through the physical environment. How do we make what we want to achieve happen? It is hard, challenging – and important – to be able to transition from being the visionary to asking an architect to build the actual wall, in that exact spot, in minute detail.

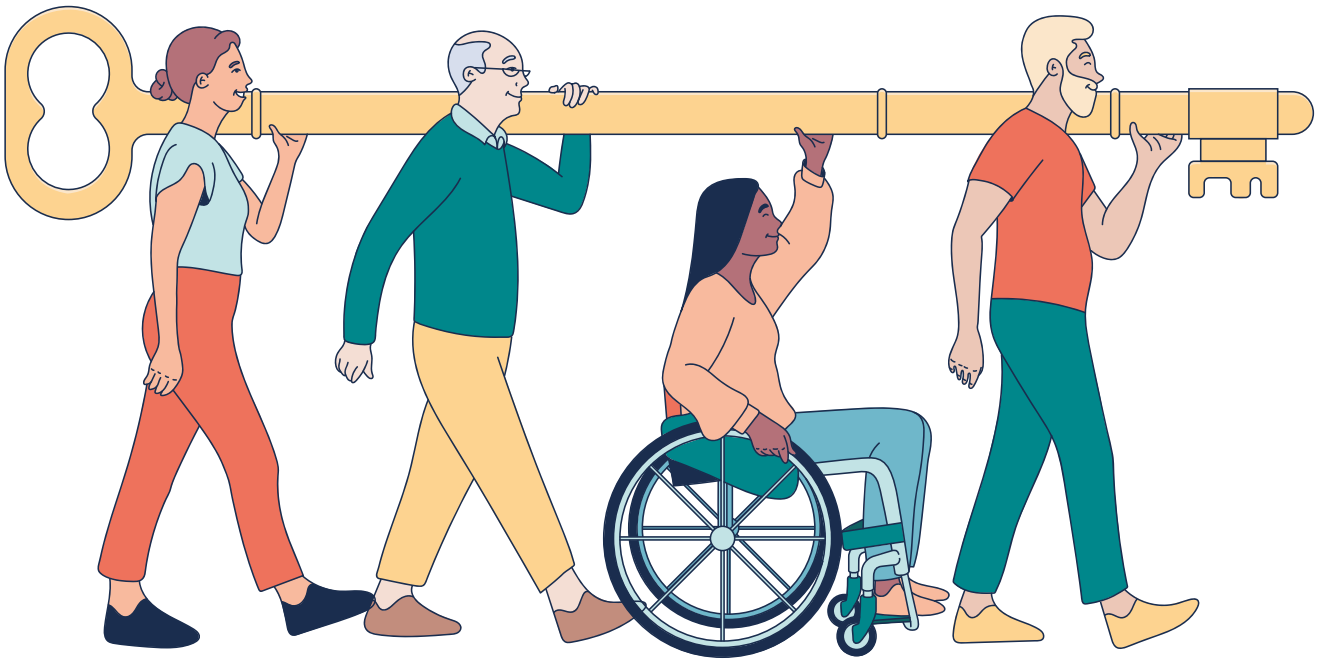
Stavem's vision for school design is crystal clear:

"My point is that traditional school furnishings, with identical desks and chairs, invite a view that everyone is the same, all bodies are the same, and everyone learns in the same way. I want a school inviting variety, accomodating for all kinds of bodies. I think it is the school's responsibility to bridge the need for individually adapted teaching with universal design, based on a common understanding that all people are different – and that school is for everyone.

INTERNATIONAL VOICES

International cooperation is key to success

KS Network for Universal Design was established in 2013, to contribute to an inclusive society by sharing best practices and removing barriers. The network stretches far beyond the Norwegian borders. We have asked some of our contacts in the Nordic countries, Europe and beyond to comment on the value of international and cross-sectoral cooperation.



FRANCESC ARAGALL

President and Founder of Design for All Foundation

A non-profit organisation based in Barcelona, Spain, and working at an international level. The foundation aims to support companies, public institutions and education organisations to better adjust the design of environments, products and services to human diversity.

HENRIK EHRLINGTON

Development Manager for Accessibility and Universal Design, City of Gothenburg

The Property Management Administration is responsible for coordinating the physical accessibility for the entire city of Gothenburg and its 500.000 inhabitants. That implies offering support and knowledge on a structural level to the city's different departments, raising awareness on how to embed universal design-thinking into the everyday activity and planning in the Swedish city.

LENA MELLBLADH AND HERAWATI ISKANDAR NOWAK

Accessibility Adviser and Disability Adviser, City of Borås

The local supply administration must ensure that the City of Borås (Sweden) can offer residents healthy and efficient premises as well as facilities for municipal activities. They are responsible for local resource planning, new and rebuilding, technical and financial management. The City of Borås won the Access City Award in 2015 for its commitment to making "a Borås accessible for all".

HELLE NEBELONG

Landscape Architect and Director at Helle Nebelong

Helle Nebelong works within health design, with the objective to create environments improving people's quality of life. She is especially passionate about designing spaces for children and how to adapt and improve the city for everyday life. She is based in Denmark, but works on projects both nationally and internationally, and also gives lectures around the world.

YUVAL WAGNER

Founder and Chair of Access Israel

Established in 1999, Access Israel is the first non-profit organisation in Israel promoting accessibility and inclusion, striving to make Israel a place where people with various disabilities are integrated into society with dignity, respect, equal rights and maximum independence. Covers many areas, such as promoting legislation and raising awareness, runs accessibility consulting services, a web portal and a complaint centre, and also offers accessibility awareness training to schools and companies – amongst others.

In the last couple of years, Access Israel has focused on making future technologies and digital services accessible in advance for the use of people with disabilities.

MICHAEL FEMBEK

Programme Manager of Essl Foundation and Director of the Zero Project

The Essl Foundation is an Austrian foundation supporting social innovation, social entrepreneurship and persons with disabilities.

PAULA REID

Project Manager at the Zero Project, working on the international perspective – until December 2020

The Zero Project was initiated by the Austrian Essl Foundation in 2008, to support the implementation of the UN Convention on the Rights of Persons with Disabilities (CRPD) and to work for a world without barriers.

MARIANNE WAITE

Director of Inclusive Brands, The Valuable 500

The Valuable 500 is a global CEO community revolutionising disability inclusion through business leadership and opportunity. Their ambition is to fundamentally transform the global business system to create an equal and inclusive society for the 1.3 billion people living in the world with a disability. The organisation is based in London, UK.

ANNE KATHRINE FRANDSEN

Senior Researcher, Education Coordinator and Deputy Head of the Institute for the Built Environment, University of Aalborg

The Danish Institute offers a Professional Master in Universal Design, a part time two year-long study for architects, engineers, entrepreneurs, urban planners and others with an interest for universal design and accessibility. The Master programme was established in 2014.

VERONIKA EGGER

President of Design for All in Austria

A non-profit membership organisation, established in 2016, dedicated to promoting a Design for All approach in all aspects of development and design in Austria. Members are professionals in the fields of architecture, design, planning or facility management as well as companies in trade and industry.

MARKUS HAAS

Managing Director and Vice President of "freiraum-europa – the experts for accessibility", and Vice President Finance EIDD Design for All Europe

freiraum-europa is a non-profit organisation established in 2003 and based in Austria, campaigning for a life free from barriers. They define themselves as both a lobby group and an aid organisation.

JØRGEN TRYK HANSEN

Architect, City of Viborg

The City of Viborg in Denmark participated in a European project for accessibility between 2010 and 2016, where the goal for Viborg was to make a coherent network that provides equal accessibility for all to the cultural heritage in Viborg – all the time conserving the historical and archeological values of the area. The City of Viborg received in 2018 a "special mention" and in 2019 a special award concerning the cultural heritage at the Access City Awards, instituted by the European Commission.

Q1 Why is it important to work with or participate in networks with other professionals in the field of universal design?

"To me it has been interesting to observe how we started out with the term 'accessibility' and now are moving more towards universal design. The latter came up when we joined the KS network in Norway."

Lena Mellbladh, Accessibility Adviser, City of Borås

"Working with questions of accessibility is often a lonely job, so being part of a network really matters."

Herawati Iskandar Nowak, Disability Adviser, City of Borås

"Cooperation is one of the cornerstones of success for universal design."

Henrik Ehrlington, Development Manager for Accessibility and Universal Design, City of Gothenburg

"We know that implementing accessibility for all is complex, and it requires the effort of professionals. Being part of a network may increase that level of professionalism."

Yuval Wagner, Founder and Chair of Access Israel

"If we keep working individually in our silos we won't get much further. If you want to succeed with inclusive employment, for instance, you need to involve several key actors – from government to people with disabilities."

Michael Fembek, Programme Manager of Essl Foundation and Director of the Zero Project

"Knowledge is power, but to me knowledge becomes powerful only when it is shared with others."

Helle Nebelong, Landscape Architect and Director at Helle Nebelong

"You meet people who are doing things you didn't know about, challenging you to develop further. There is a huge power in networks."

Paula Reid, Project Manager at the Zero Project (until December 2020)

"Freedom of barriers requires several individual approaches, and one person or one organisation alone cannot cover them all."

Markus Haas, Managing Director and Vice President of "freiraum-europa – the experts for accessibility", and Vice President Finance EIDD Design for All Europe

"The field in itself is cross-disciplinary, and therefore it is essential to arrange for the different disciplines to meet and cooperate."

Anne Kathrine Frandsen, Senior Researcher, Education Coordinator and Deputy Head of the Institute for the Built Environment, University of Aalborg

"The complexity of any design project has increased hugely the last 20 years. No single profession can reasonably cover all the perspectives and it is necessary to bring cross-disciplinary knowledge to any project."

Veronika Egger, President of Design for All in Austria

Q2 How important is it to share good (and bad) examples regionally, nationally and internationally?

"The key to success is understanding the lingo of your audience and adapting to that. For instance, if I am talking to entrepreneurs and business people, I focus on and use terms such as 'return on investments' and 'financial benefits' of ensuring accessibility for all. When meeting architects, I never tell them what to do, but show them how universal design is integrated in a design concept."

Francesc Aragall, President and Founder of Design for All Foundation

"It is extremely important to share examples, but also difficult sometimes. As a small association we don't have the resources to formally develop and share case studies."

Veronika Egger, President of Design for All in Austria

"We share only good practices, as focusing on bad ones is not far away from blaming and shaming."

Michael Fembek, Programme Manager of Essl Foundation and Director of the Zero Project

"It is important to share knowledge and best practice – so that we don't have to reinvent the wheel every time. In addition, I find it particularly relevant to share the bad experiences. Making mistakes is human, but you can learn a lot from it. I once placed a thorny rose bush in a pergola for blind people – not very wise. But by telling people about that, I can help others avoid making the same mistake."

Helle Nebelong, Landscape Architect and Director at Helle Nebelong

"Sharing examples – good or bad – is essential. We can learn from mistakes, and develop further. We can copy and implement directly the good examples."

Markus Haas, Managing Director and Vice President of "freiraum-europa – the experts for accessibility", and Vice President Finance EIDD Design for All Europe

"At The Valuable 500 we see this from a global perspective, and it is fascinating to observe the different maturity levels around the world. Best practices are brilliant, but it is just as important to share mistakes. It is nothing to be ashamed of, on the contrary. Learning from failure is how we get better."

Marianne Waite, Director of Inclusive Brands, The Valuable 500

"We are true believers in sharing and learning from each other, and in exploring potential solutions together. In the unique case of accessibility and inclusion we believe there is no place for competition – we are all on the same mission. It's our obligation to share and help others, and – to quote the UN – make sure to 'Leave no one behind'."

Yuval Wagner, Founder and Chair of Access Israel

"Sharing experiences, good and bad, is important to understand why some things work and others don't."

Anne Kathrine Frandsen, Senior Researcher, Education Coordinator and Deputy Head of the Institute for the Built Environment, University of Aalborg

"Highlighting, sharing and communicating innovative practices and policies that support the rights and lives of persons with disabilities, are at the core of our activity in the Zero Project. We prefer to focus on the good examples as we see that as being key to ensuring best practice spreads as quickly and effectively as possible."

Paula Reid, Project Manager at the Zero Project (until December 2020)

"We recognise that some of our solutions are not applicable everywhere, and our organisational structures and laws may differ from other countries. I think, for instance, that a lot of our efforts would not have taken place without our Swedish discrimination laws."

Herawati Iskandar Nowak, Disability Adviser, City of Borås

Q3 What is the importance of both informal and formal competence and/or education within universal design?

"I believe that the concept of human diversity should be taught on a general level – as they do in Japan. Already in third grade, pupils learn about the concept of universal design. Today, 70 percent of the Japanese population know what it is – and I believe that respecting human diversity from the beginning helps a lot."

Francesc Aragall, President and Founder of Design for All Foundation

"You can obtain knowledge through books and literature, but true understanding of the challenges people with disabilities face, is only obtained through a practical approach."

Helle Nebelong, Landscape Architect and Director at Helle Nebelong

"There is still much to do for Israel to be fully accessible and inclusive. To reach this goal we need to educate both the accessibility consultants and the decision makers that are to implement accessibility in their organisations."

Yuval Wagner, Founder and Chair of Access Israel

"People who live with a disability have important competence through experience, and combining their knowledge with people possessing the formal competence will help getting a holistic perspective to the field of universal design."

Henrik Ehrlington, Development Manager for Accessibility and Universal Design, City of Gothenburg

"We still lack the knowledge and the resources to fully grasp the scope of universal design."

Jørgen Tryk Hansen, Architect, City of Viborg

"I believe that more formal competence is key in codifying the concepts of universal design so they can be applied practically."

Paula Reid, Project Manager at the Zero Project (until December 2020)

"More universal design thinking into all professions, that should be our goal."

Veronika Egger, President of Design for All in Austria

"I think informal competence is important, but there should be a basic formal competence in universities."

Markus Haas, Managing Director and Vice President of "freiraum-europa – the experts for accessibility", and Vice President Finance EIDD Design for All Europe

"Formal competence gives you the ability to move the discussion to the right level. Then, of course, we still need the experience of the users – these perspectives need to be combined with the formal competence."

Anne Kathrine Frandsen, Senior Researcher, Education Coordinator and Deputy Head of the Institute for the Built Environment at the University of Aalborg

"I believe we are starting to see a disability awareness in the younger generations, they are the new inclusive thinkers. Inclusive design should be part of the education of not only creative professions, but within HR, policy design etc."

Marianne Waite, Director of Inclusive Brands, The Valuable 500

"The concept of universal design is still rather vague, yet easy to explain, especially through practical examples. Therefore, we need both informal and formal competence in this field."

Michael Fembek, Programme Manager of Essl Foundation and Director of the Zero Project

Q4 What is the significance of research on and documentation of universal design?

"Research is important, but we need the connection between research and those implementing measures to be strengthened. In the end, this is all about doing it right from the beginning."

Herawati Iskandar Nowak, Disability Adviser, City of Borås

"I see research and documentation as essential in maintaining knowledge that otherwise would be lost."

Helle Nebelong, Landscape architect and director at Helle Nebelong

"Research and documentation are important, so that we can move beyond the 'why' and go directly to the 'how' of universal design. We need to explain how to implement, and how to make it right from the start."

Henrik Ehrlington, Development Manager for Accessibility and Universal Design, City of Gothenburg

"Even though we've dealt with issues of inclusive design for years, we are still at the very beginning of the field. On the one hand, we have to go back and redesign retroactively using standards of universal designs and inclusive designs. On the other hand, we have to make sure that every future design, product and service will be accessible for all by design."

Yuval Wagner, Founder and Chair of Access Israel

"We need to get more research and documentation on the field, which also means getting researchers interested in working on this and taking part in committees and think tanks."

Michael Fembek, Programme Manager of Essl Foundation and Director of the Zero Project

"Documentation should be an integral part of any design project."

Veronika Egger, President of Design for All in Austria

"Research and documentation of universal design will contribute to making it more robust and concrete, and not just a theoretical concept."

Paula Reid, Project Manager at the Zero Project (until December 2020)

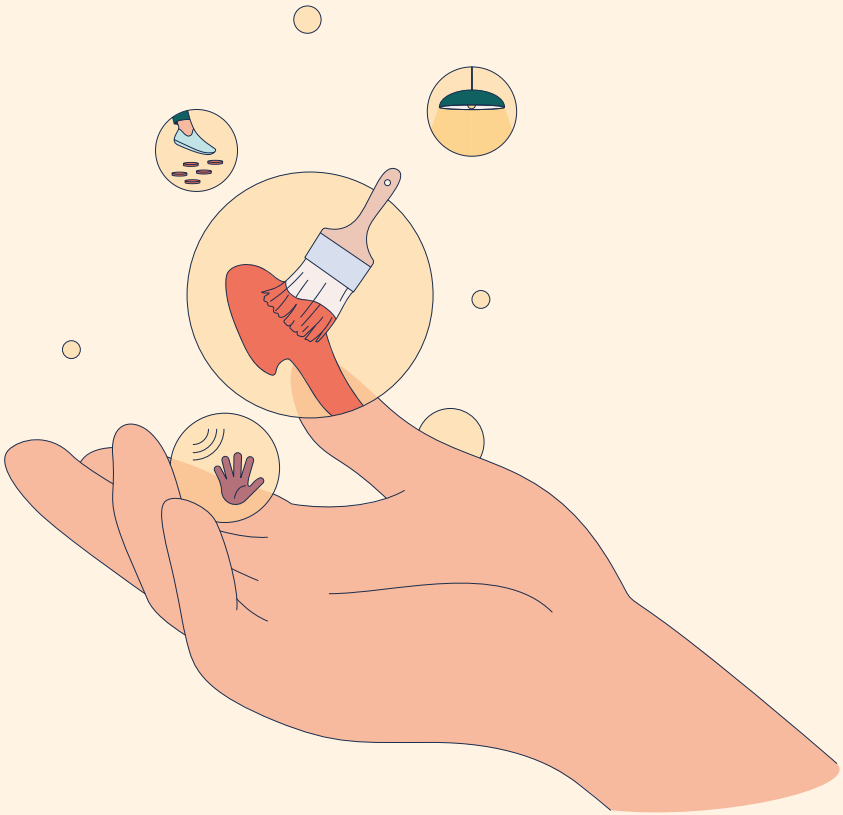
"I think it is important to evaluate more, that will give us the wisdom to improve future projects. We need to understand what this is all about, and have a more theoretical approach to establishing a language and terms for the needs, the users and the processes."

Anne Kathrine Frandsen, Senior Researcher, Education Coordinator and Deputy Head of the Institute for the Built Environment, University of Aalborg

"Research is essential, as universal design and accessibility is a very complex field. We need some 'burning souls' who want to see the entire picture and have the stamina to go through with it."

Jørgen Tryk Hansen, Architect, City of Viborg

This is how universal design is defined in Norway



Norway bases the understanding of universal design on the 1997 definition and seven principles by Center for Universal Design, North Carolina State University (US).

The principles were developed by a group of architects, product designers, engineers and environmental design researchers, led by the late Ron Mace.

Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

1

Equitable Use

The design is useful and marketable to people with diverse abilities.

Guidelines:

1a. Provide the same means of use for all users: identical whenever possible; equivalent when not.
1b. Avoid segregating or stigmatizing any users.
1c. Provisions for privacy, security, and safety should be equally available to all users.
1d. Make the design appealing to all users.

2

Flexibility in Use

The design accommodates a wide range of individual preferences and abilities.

Guidelines:

2a. Provide choice in methods of use.
2b. Accommodate right- or left-handed access and use.
2c. Facilitate the user's accuracy and precision.
2d. Provide adaptability to the user's pace.

3

Simple and Intuitive Use

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

Guidelines:

3a. Eliminate unnecessary complexity.
3b. Be consistent with user expectations and intuition.
3c. Accommodate a wide range of literacy and language skills.
3d. Arrange information consistent with its importance.
3e. Provide effective prompting and feedback during and after task completion.

4

Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Guidelines:

4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
4b. Provide adequate contrast between essential information and its surroundings.
4c. Maximize "legibility" of essential information.
4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

5

Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Guidelines:

5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
5b. Provide warnings of hazards and errors.
5c. Provide fail safe features.
5d. Discourage unconscious action in tasks that require vigilance.

6

Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue.

Guidelines:

6a. Allow user to maintain a neutral body position.
6b. Use reasonable operating forces.
6c. Minimize repetitive actions.
6d. Minimize sustained physical effort.

7

Size and Space for Approach and Use

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Guidelines:

7a. Provide a clear line of sight to important elements for any seated or standing user.
7b. Make reach to all components comfortable for any seated or standing user.
7c. Accommodate variations in hand and grip size.
7d. Provide adequate space for the use of assistive devices or personal assistance.

Source:
Centre for Excellence in Universal Design

The UN Convention on the Rights of Persons with Disabilities (CRPD)
Norway also follows the Human Rights based approach to persons with disabilities, and the definition of universal design as stated in Article 2 of the convention: "The design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design", not excluding "assistive devices for particular groups of persons with disabilities where this is needed."

Equality and Anti-Discrimination Act
Universal design is embedded in several laws and regulations, such as the Planning and Building Act and Regulations on technical requirements for construction works (Tek17). The Equality and Anti-Discrimination Act, Chapter 3, section 17, defines universal design as:

«Universal design» means designing or accommodating the main solution with respect to the physical conditions, including information and communications technology (ICT), such that the general functions of the undertaking can be used by as many people as possible, regardless of disability.

KS IN ENGLISH
Read more about KS' work on universal design on our website: https://www.ks.no/om-ks/ks-in-english/

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