

LEARNING

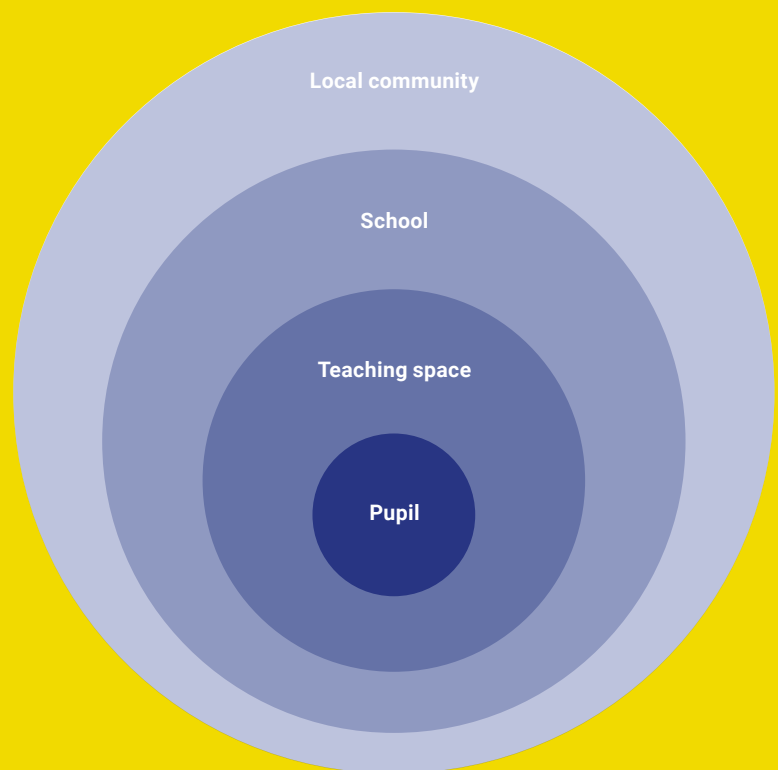
Examples of educational architecture
stimulating wellbeing, learning
and social relationships
for children and young people

DANISH
ASSOCIATION OF
ARCHITECTURAL FIRMS

” Our schools in Denmark must embrace everyone – motivate the idle, inspire the gifted and offer stability and a better start in life for the vulnerable pupils. Denmark must be the best country in the world for children.

Pernille Rosenkrantz-Theil, Minister of Children and Education, 2019

KALVEBOD FÆLLED SCHOOL, LUNDGAARD & TRANBERG ARKITEKTER	PAGE 6
DTU COMPUTE, CHRISTENSEN & CO. ARCHITECTS	PAGE 10
FREDENSBORG SCHOOL AT VILHELMSRO, RUBOW ARKITEKTER	PAGE 14
VESTEGNEN HF & VUC, H+ ARKITEKTER	PAGE 18
GRINDSTED SCHOOL, PLUSKONTORET ARKITEKTER	PAGE 24
CAMPUS BORNHOLM, CUBO / NOVA5	PAGE 28
SOUTH HARBOUR SCHOOL, JJW ARKITEKTER	PAGE 32
FREDERIKSBJERG SCHOOL, HENNING LARSEN / GPP ARKITEKTER / MØLLER & GRØNBORG	PAGE 36
GLASIR COLLEGE, BIG – BJARKE INGELS GROUP / FUGLARK	PAGE 42
ØRESTAD SCHOOL, KHR ARCHITECTURE	PAGE 46
SKOVBAKKE SCHOOL, CEBRA ARCHITECTURE	PAGE 50
COPENHAGEN INTERNATIONAL SCHOOL, C.F. MØLLER ARCHITECTS	PAGE 54



The architecture and spatial qualities of educational facilities have an enormous influence on the wellbeing and learning of pupils and students – and are often an important resource for the local community.

Pupil-centric. In this booklet, the Danish Association of Architectural Firms presents a number of cases illustrating how architecture creates value for pupils, students, teachers and local communities through carefully considered and well-designed schools and other educational facilities.

Wellbeing, behaviour and learning can be influenced positively by the way school facilities are designed, and architecture has a strong impact on pupil-teacher interaction. Research shows that the spatial qualities and interior design of classrooms and other study facilities can influence learning significantly. The surroundings can encourage both concentration, calm and activity. Therefore, it is important to work with a nuanced understanding of the correlation between space, wellbeing and learning, to ensure that the building supports the intentions and methodologies applied by teachers and institutions. Good architecture means a good workplace for teachers and pupils.

School buildings are a resource; not just for the educational institution but for the surrounding community as well. Many examples demonstrate that schools have important strategic significance for neighbourhood and local community development.

The large floorspace and attractive outdoor areas can often be used more intelligently, so that the facilities can house more activities over a longer period if functions in addition to teaching, for example for the local community, are incorporated. The savings from working with more efficient space utilisation can be reinvested in new teaching initiatives and facilities.

We hope that this publication will inspire all those who are passionate about creating the best possible learning environment for children and young people.



URBAN SCHOOL ON THE EDGE OF NATURE

KALVEBOD FÆLLED SCHOOL, LUNDGAARD & TRANBERG ARKITEKTER

At Kalvebod Fælled School, the sports hall lies at the heart of the building. There is room for both community activities and individual contemplation, and the school is an attractive meeting place for the new urban district of Ørestad Syd, even outside school hours.

Poised between the city and the picturesque commons of Kalvebod Fælled, the circular school strengthens the community by inviting residents to use the school's indoor and outdoor spaces for recreational activities outside school hours. The sports hall at the heart of the school is visible from all five floors of the building, and the playground outside blends in with the surrounding nature to make an active landscape.

Movement, play and activity have received special attention, giving pupils ample opportunity for exercise throughout their school day. An exciting building design with individualised spaces such as built-in seating in the facade, makes room for breaks and for individual pupil needs. Moreover, it motivates and allows for varied teaching. By placing the sports hall inside the school, the building project could be pared down from two buildings to a single. At the same time the circular design optimises the building volume, reducing the facade area by one-third.

The money saved has instead been used to create added value through beautiful and robust materials and enticing learning environments, benefitting pupils, teachers and other staff, as well as visitors who regularly stop by this school on the edge of nature.

Photo: Torben Eskerød



Photo: Torben Eskerod

” Despite the school’s very open design, it’s very peaceful and quiet – even when the sports hall is bustling with activity. It’s actually quite amazing. The acoustics are very, very good!

Eva Susanne Holm-Jørgensen, Head of project, The Finance Administration

ARCHITECTS LUNGAARD TRANBERG ARKITEKTER
LANDSCAPE BOGL
COLLABORATION PARTNERS JJW ARKITEKTER
CLIENT CITY OF COPENHAGEN, FINANCE ADMINISTRATION, BYGGERI KØBENHAVN
ENGINEER JØRGEN NIELSEN RÅDGIVENDE INGENIØRER | DANSK ENERGI MANAGEMENT & ESBENSEN | GADE MORTENSEN
CLIENT CONSULTANT COWI
GENERAL CONTRACTOR MT HØJGAARD
LOCATION COPENHAGEN, DENMARK
TYPE NEW BUILDING
USE SCHOOL
COMPLETED 2018
SIZE 11.560 M²
CONSTRUCTION COST DKK 390 MILL.



Photo: Anders Sune Berg



ARCHITECT CHRISTENSEN & CO. ARCHITECTS
LANDSCAPE KRAG & BERGLUND LANDSKABSARKITEKTER
CLIENT TECHNICAL UNIVERSITY OF DENMARK (DTU)
ENGINEER HENRIK LARSEN RÅDGIVENDE INGENIØRER | ANDERS CHRISTENSEN RÅDGIVENDE INGENIØRER
CONTRACTOR G. TSCHERNING | E. PIHL & SØN
LOCATION LYNGBY, DENMARK
TYPE NEW BUILDING
USE EDUCATION
COMPLETED 2013
SIZE 4.600 M²
CONSTRUCTION COST DKK 99 MILL.

A GREEN INNOVATION COMMUNITY DTU COMPUTE, CHRISTENSEN & CO. ARCHITECTS

DTU Compute works with green, sustainable solutions from top to bottom. Open walkways and indoor vegetation help ensure wellbeing, social interaction and a healthy indoor climate.

At the Department of Applied Mathematics and Computer Science at the Technical University of Denmark (DTU Compute), learning and green solutions go hand in hand, and the architectural design integrates a multitude of climate, structural and energy-technology solutions.

At DTU Compute, they know that plants and trees contribute to better learning and wellbeing. Studies show that adding a little green can reduce absenteeism and fatigue, boost energy levels, and help strengthen concentration and productivity. On the ground floor, 30 trees provide clean air and help the building breathe. A hybrid ventilation system – developed by the university's own researchers – makes sure that the building uses 95% less energy compared to traditional ventilation systems.

Furthermore, rainwater is collected in underground water containers and then used to water trees and flush toilets. The interior landscape is like a green oasis, with trees that fill the rooms and improve the indoor climate by cleaning the air, absorbing heat in summer and adding humidity in winter.

Photo: Adam Mork



DTU Compute utilises surplus heat from other parts of the university campus in an intelligent ventilation system capable of recovering up to 70% of the surplus heat. The remaining electricity and ventilation demand are met through solar panels on the building.





Photo: Adam Mark

THE SCHOOL IN THE FOREST: AN ENVIRONMENTAL ROLE MODEL

FREDENSBORG SCHOOL
VILHELMSRO,
RUBOW ARKITEKTER

Fredensborg School Vilhelmsro lies between suburbia and the surrounding landscape. The school is a shining example of climate-resilient architecture.

The Municipality of Fredensborg is a ‘climate municipality’ and therefore wanted the school at Vilhelmsro to be a sustainable example and environmental role model for future school building projects. The project integrates several climate-friendly solutions, such as green roofs, geothermal heating and local rainwater management. The rainwater is collected and led into a newly established retention pond. Today, the fauna and flora around the pond have become an integral part of the school’s outdoor learning spaces. The school is located amidst natural surroundings, and the transition between inside and outside makes for flexible teaching environments and resting areas. The buildings are connected via skywalks at first-floor level, allowing the local community to pass through the school’s areas and use its recreational landscape. The natural landscape around the school has been left to grow and develop freely, and it sustains the learning environment with a rich animal and plant life that can be incorporated in teaching. The close vicinity of the surrounding landscape provides a break from everyday life, reduces stress levels in pupils and teachers, and promotes wellbeing, exercise and healthy behaviour.

” Green outdoor spaces help make the workday more satisfying and less stressful. The view of the green areas alone generates more wellbeing and reduces stress

Lene Lottrup, Landscape architect,
Uderum & Arbejdsliv (outdoor spaces and work life), PhD dissertation, 2012

ARCHITECT RUBOW ARKITEKTER
LANDSCAPE LASSEN LANDSKAB
CLIENT FREDENSBORG MUNICIPALITY
KNOWLEDGE PARTNER NIRAS, KLIMADAN
TURNKEY CONTRACTOR G.V.L. ENTREPRISE
ENGINEER OLUF JØRGENSEN
LOCATION VILHELMSRØ, FREDENSBORG, DENMARK
TYPE NEW BUILDING
USE EDUCATIONAL INSTITUTION
COMPLETED 2013
SIZE 8.900 M² BUILDINGS / 44.000 M² LANDSCAPE
CONSTRUCTION COST DKK 118 MILL.



Photo: Rune Lohjansen



INNOVATIVE AND OPEN ENVIRONMENT FOR ADULT EDUCATION

VESTEGNEN HF & VUC, H+ ARKITEKTER

An adult-education learning environment sets the scene for a joint upper-secondary school and adult vocational centre in the city of Rødovre. The school building has been ideally positioned to harvest the daylight and make use of solar energy.

An open and warm educational institution in Rødovre is home to courses for adults. Here, lighting and interior design have received special attention. The result is a school without hallways, with transparent classrooms and a carefully designed colour and lighting regime to ensure a bright learning environment. The natural characteristics and colours of wooden materials dominate throughout, providing a warm and cosy environment. Vestegnen HF & VUC can now boast high user satisfaction from students and teachers alike, and the open common spaces supported by the physical design are an important contributory factor. The school has been designed such that one-third of learning spaces are open, and all spaces and rooms are furnished to encourage variation in teaching. To provide students and course participants with variation in teaching, teachers can easily move their teaching to another space better suited to the relevant learning situation.

Photo: Tim B. Wahlfrid



ARCHITECT H+ARKITEKTER
CLIENT VESTEGNEN HF & VUC
ENGINEER BASCON
ASSISTANT CONSULTANT BASCON
GENERAL CONTRACTOR DAUREHØJ ERHVERVSBYG
LOCATION RØDOVRE, DENMARK
TYPE NEW BUILDING
USE SCHOOL
COMPLETED 2016
SIZE 2.800 M²
CONSTRUCTION COST DKK 56 MILL.

” General student satisfaction is 10% higher at our campus in Rødovre than in the Albertslund campus. The physical environment contributes to this, but the general atmosphere and experience of feeling safe and not alone is also an important factor.

Tue Sanderhage, Director, Vestegnen HF & VUC

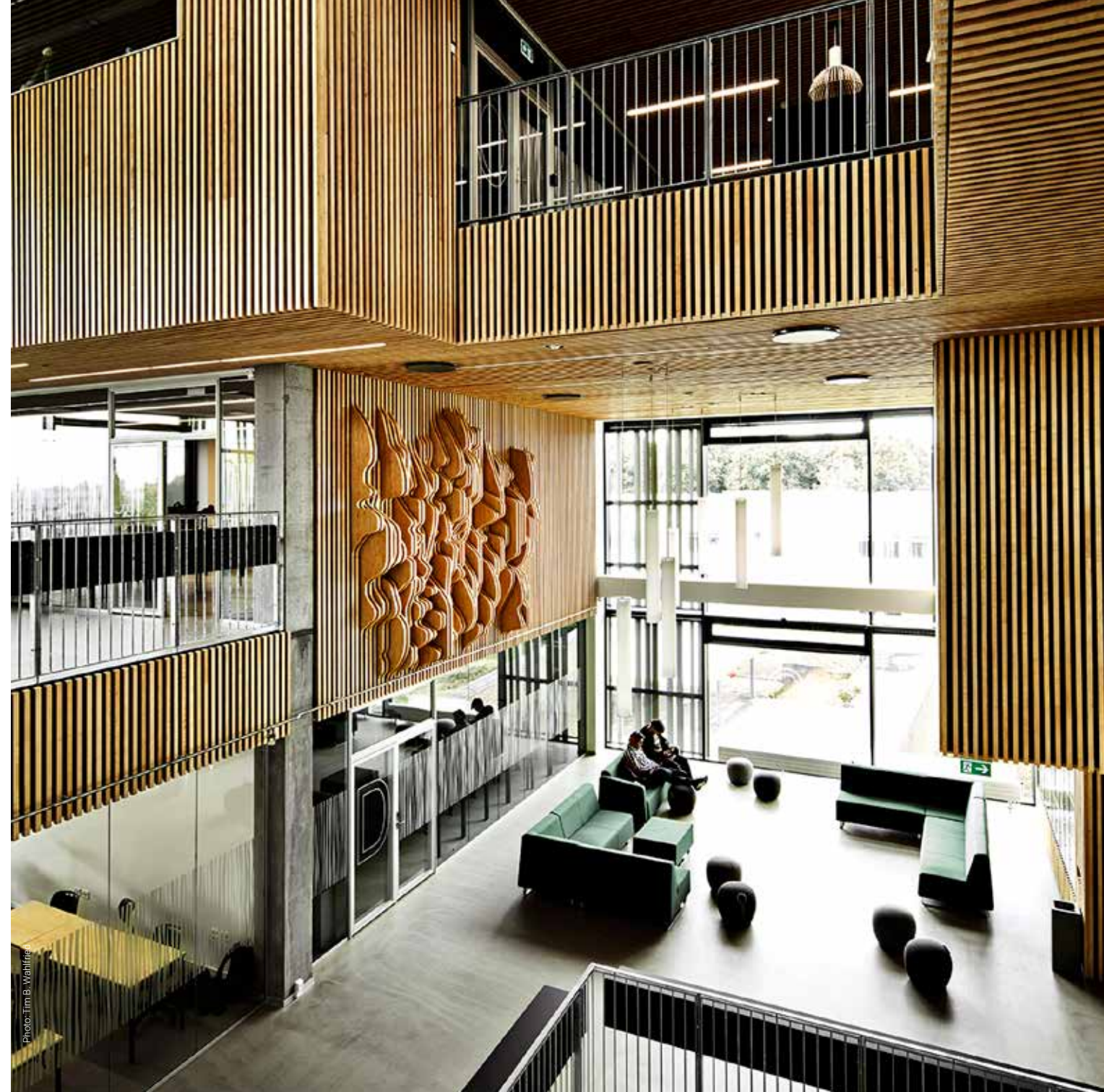


Photo: Tim B. Wahlfrieg

A vast amount of space – indoors and outdoors – is being used inefficiently or is not being used at all. Danish public schools on average have 50% unused space in the period between 8am and 2pm – after 2pm the ratio is even lower.

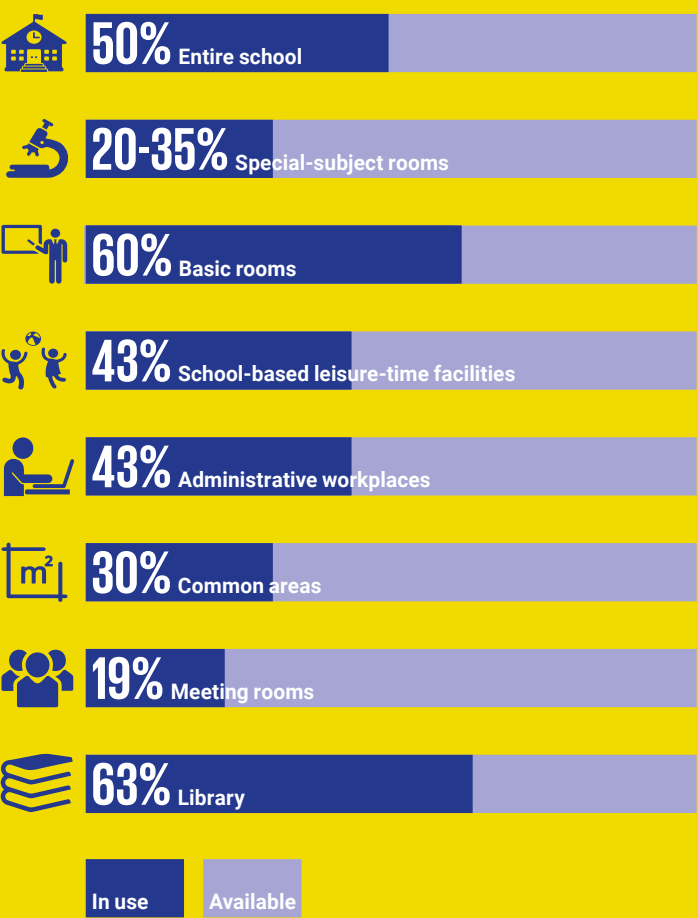
A huge potential can be harvested by improving space utilisation at educational institutions, benefitting both the institutions themselves and the local community.

If we look at how often classrooms and other school facilities are reserved in the booking system and compare this with their actual use, we will often find unused capacity.

Could we have more activities in the same space? If we could use the space more optimally, we could free up funds for more activities or for better teaching facilities. The principles behind the concept of ‘intelligent square metres’ in school architecture spotlight well-being, differentiated spaces and better space utilisation.

If we could fit in more uses and activities under the same roof when planning and designing buildings using flexible solutions, more people would be able to use the building as a spatial resource.

There’s a new trend in educational architecture; in new building and in renovation. Schools are already a hub for activities in their local community and now they are opening their space to new and more uses outside school hours. Attractive outdoor areas and accessible common areas can make a huge difference for community life, recreation and outdoor activity.



Observations of actual use in the hours between 8am - 4pm.

Illustration: "Kloge Kvadratmeter" (intelligent square metres), Andersen & Antorini, 2017

VILLAGE SCHOOL TAILORED FOR AND BY PUPILS GRINDSTED SCHOOL, PLUSKONTORET ARKITEKTER

The pupils at Grindsted School know where and how they best learn. From the very beginning, the architects involved in the Grindsted School project included both pupils and teachers in the design of the building's rooms and functions. One result of this is far less traditional classroom teaching.

At Grindsted School, pupils helped design their own learning environments, and the existing buildings were exploited by developing further the traditions inherent in the existing materials and design. The school is shaped like a typical village farm, with four buildings arranged around a square courtyard and classroom windows out to the forest.

Even though the school is rather small, it's important to the local community. Therefore, the pupils were involved early in the planning phase to better understand their favourite places to learn. Taking inspiration from the pupils, the architects integrated space for peace and contemplation, secret hide-aways and soft furniture to promote pupils' wellbeing and entice them to learn. Respecting the existing buildings, the architects opted for yellow brick, but with the back facing outwards to create a contrast between the old and new.



Photo: Jesper Beilby



Photo: Jesper Balteby

ARCHITECT **PLUSKONTORET ARKITEKTER**
 LANDSCAPE **PLUSKONTORET ARKITEKTER**
 CLIENT **AALBORG MUNICIPALITY**
 CONTRACTOR **ARNE ANDERSEN VRÅ | EL:CON | GRØNBORG EL | SONDRUP OG POULSEN | MALERNES AKTIESELSKAB AALBORG | MFL.**
 ENGINEER **ORBICON**
 LOCATION **VODSKOV, AALBORG, DENMARK**
 TYPE **ADDITION/REFURBISHMENT**
 USE **SCHOOL**
 COMPLETED **2017**
 SIZE **915 M² ADDITION, 200 M² REFURBISHMENT**
 CONSTRUCTION COST **DKK 17 MILL.**

” A total of 92% of staff, management and parent representatives say that active and varied teaching has become ‘much easier’ in the new, differentiated learning environment.”

Evaluation questionnaire and interviews, 2019



Photo: Jesper Balteby



Photo: Martin Schubert

EDUCATIONAL INSTITUTION UNITES BORNHOLM CAMPUS BORNHOLM, CUBO / NOVA5

Campus Bornholm aims to secure local, highly skilled labour and play an important role for businesses by offering a broad range of opportunities for education and further training on the island of Bornholm.

Rønne is home to Campus Bornholm, the island's largest educational institution promoting a vision of knowledge. It's all about ensuring the future of the island. Value should be created through realisation; because the alternative is that young islanders move to the main-land, draining the island of important brains for the local business community.

The new shared campus gathers all schools, educational courses and programmes into a single campus, thus creating an attractive, coherent and diverse learning environment in which resources can be shared across programmes, and where pupils, students and employees can meet and mingle on a daily basis.

The young islanders have access to qualifying education, and, in the long term, this will result in highly skilled labour and an island population that still includes a large number of students.

The school is a good example of how to embrace learning environments in remote areas and work with social sustainability.



ARCHITECT CUBO | NOVA5
LANDSCAPE HENRIK JØRGENSEN LANDSKAB
CLIENT CAMPUS BORNHOLM, DANISH MINISTRY OF EDUCATION
ENGINEER DOMINIA | LARS ØRTOFT CONSULTING ENGINEER
CONTRACTOR PLENTERPRISE | GVL ENTERPRISE | RIBE VVS SERVICE
CLIENT CONSULTANT COWI | KANT ARKITEKTER
FULL-SERVICE CONSULTANT CUBO
LOCATION RØNNE, BORNHOLM, DENMARK
TYPE NEW BUILDING / EXTENSION
USE SCHOOL
COMPLETED 2018
SIZE 15.435 M² EXTENSION | 5.500 M² REFURBISHMENT
CONSTRUCTION COST DKK 380 MILL.

” The joining of schools, educational courses and programmes in a modern and future-proof campus makes it possible to preserve and develop more attractive educational offers, which, in turn, helps create opportunity for new cross-educational communities when paths cross in the large common areas.”

Inge Prip, Director, Campus Bornholm



A MULTI-FUNCTIONAL MEETING PLACE

SOUTH HARBOUR SCHOOL, JJW ARKITEKTER

At South Harbour School, all the floors have direct access to outdoor recreational areas, and these are also available to the public. Bringing the city into the school and taking the school out into the city creates a dynamic and multi-functional meeting place for the entire neighbourhood.

The school at Copenhagen South Harbour has a floor space of 9,500m² and a total recreational area twice that size. The high ratio of recreational area not only benefits pupils but also local residents, who can enjoy the school's areas during and after school hours.

The new school has significantly increased the attraction value of the South Harbour district, particularly among young families. An automatic system ventilates the school every night, so that every school day starts with fresh air and a good indoor climate which raises everyone's level of concentration.

There are playgrounds and active teaching spaces on all the building's rooftops. The school's architecture supports both learning processes and social development through pupils' movement and encounters across classes.

The striking school vitalises the surrounding urban space, and the school at Copenhagen South Harbour has already become a landmark building in and for the neighbourhood.



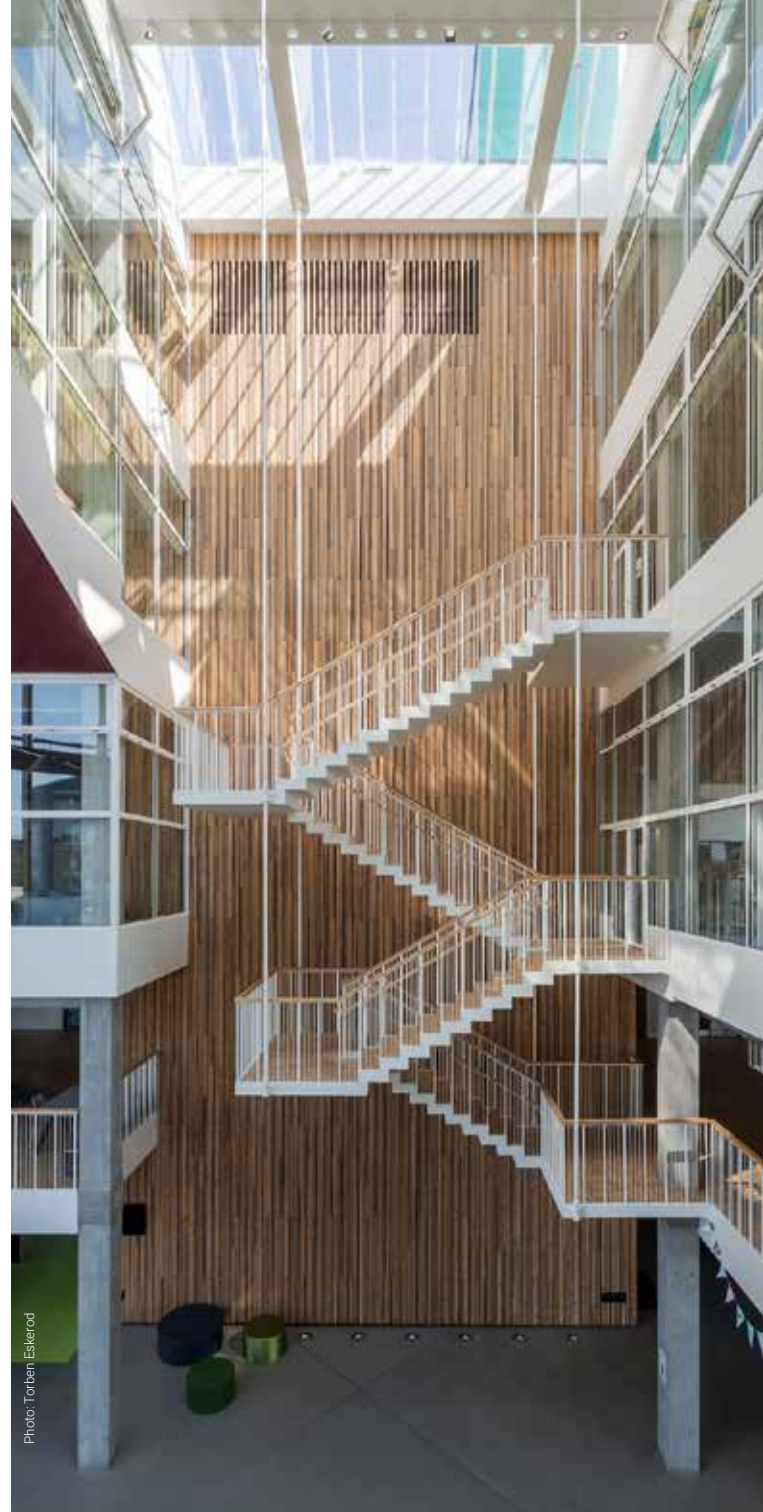
Photo: Torben Eskerød

ARCHITECT JJW ARKITEKTER
LANDSCAPE JJW ARKITEKTER | PK3 LANDSKAB
CLIENT CITY OF COPENHAGEN, CHILDREN AND YOUTH ADMINISTRATION
ENGINEER NIRAS
CONTRACTOR B. NYGAARD SØRENSEN | G.V.L. ENTREPRISE | LINDPRO | JAKON
COLLABORATION PARTNERS ARKITEKTFIRMAET FRIIS ANDERSEN | KEINICKE & OVERGAARD ARKITEKTER
LOCATION SOUTH HARBOUR, COPENHAGEN, DENMARK
TYPE NEW BUILDING
USE PUBLIC SCHOOL
COMPLETED 2015
SIZE 9.500 M² BUILDINGS, 11.000 M² LANDSCAPE
CONSTRUCTION COST DKK 250 MILL.

” Because the school’s outdoor areas are open and welcoming, many local residents use the school’s playgrounds, roof-top terraces and green areas. This means that new parents feel confident about the school long before sending their children there, and the school becomes their natural first choice.

Morten Biering, School Manager, South Harbour School

Photo: Torben Eskerød





A MECCA FOR LEARNING AND PLAY

**FREDERIKSBJERG SCHOOL,
HENNING LARSEN /
GPP ARKITEKTER /
MØLLER & GRØNBORG**

At Frederiksbjerg School, movement and exercise are an integral part of everyday life for the pupils.

Frederiksbjerg School in midtown Aarhus boasts a unique learning and school environment, which has taken the national requirement for 45 minutes of daily exercise for pupils quite literally. A total of 40 'movement zones' have been integrated into the school's indoor and outdoor architecture. According to the principal, the architecture will invariably force pupils to exercise at some time during the school day. Teaching and movement come together, and the entire building is unmistakably characterised by a 'DNA of movement'. Children learn and thrive differently, and therefore the school has been designed with environments that cater to children's differences with regard to development, wellbeing and learning, and the outdoor areas are considered just as important for children's development. There are no breaks at the school, because children should learn all the time. Outside school hours, the outdoor areas are open for use by local residents – and so children and adults are encouraged to be active and exercise.

In collaboration with a lighting designer and the School of Architecture in Copenhagen, KADK, Henning Larsen examined the relationship between lighting and pupils' concentration, and this resulted in new lamps, which also help reduce noise.



Photo: Virklund Sport

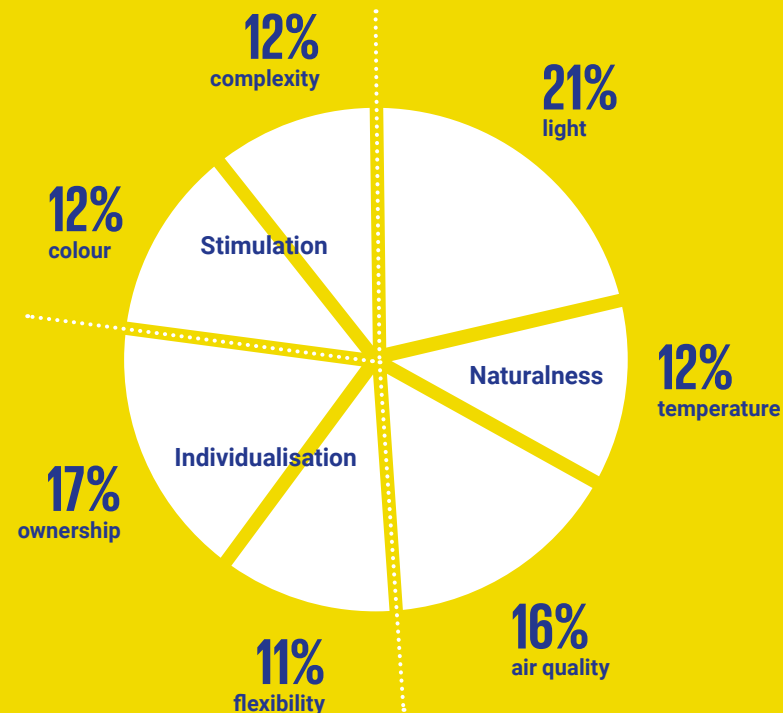
The noise level at Frederiksbjerg School has dropped by 1-6 decibels in around 75% of learning situations.

Lightning study performed as a collaboration between Henning Larsen, the School of Architecture, KADK and lighting designer Imke Wies van Mil.

ARCHITECT HENNING LARSEN | GGP ARKITEKTER
 LANDSCAPE MØLLER GRØNBORG
 CLIENT AARHUS MUNICIPALITY
 ENGINEER NIRAS
 CLIENT CONSULTANT SCHØNHERR | PLUSKONTORET | COWI
 TURNKEY CONTRACTOR HOFFMANN
 LOCATION AARHUS, DENMARK
 TYPE NEW BUILDING
 USE SCHOOL
 COMPLETED 2016
 SIZE 15.000 M²
 BUDGET DKK 260 MILL.



Photo: Peter Nørby



Important parameters in classroom design

Illustration: Clever Classrooms, University of Salford, 2015

A British study of classroom design including 3,766 pupils shows a clear correlation between pupil learning and classroom design.

Differences in the spatial qualities of rooms explain 16% of the spread in student learning. This corresponds to an average pupil being able to achieve more than 6 months of additional learning by moving from the worst to the best classroom.

The design of the classroom has an important impact on pupil and teacher wellbeing and possibilities for classroom interaction. With simple approaches, which do not have to be expensive, architects and teachers can improve rooms and optimise them for teaching:

Naturalness – the quality of light, temperature, sound and air – has been assessed to account for 50% of a room's impact on pupil learning.

Individualisation – the possibility of pupils and teachers to put their own mark on the room and adapt it to changing teaching situations – accounts for slightly more than a quarter of the room's impact on learning.

Stimulation – the balancing of complexity and colour scheme in the room - affects learning by just under a quarter.

All these elements depend on the design of the building and the opportunities it provides for teachers and pupils to create a good and healthy indoor climate. Here, daylight is the most important individual parameter.



ARCHITECT **BIG - BJARKE INGELS GROUP | FUGLARK**
CLIENT **MINISTRY OF FOREIGN AFFAIRS AND CULTURE, FAROE ISLANDS**
ENGINEER **LEMMING & ERIKSSON | MARTIN E. LEO SP/F | KJELRAD RADGEVANDI | BIG ENGINEERING**
CONTRACTOR **LM | DEMICH | BRONDUM | ARTICON | HVT | HSH | MTHØJGAARD | TGV | LAFUCO**
COLLABORTION PARTNERS **ROSAN BOSCH | SAMAL JOHANNESSEN**
LOCATION **TÓRSHAVN, FAROE ISLANDS**
TYPE **NEW BUILDING**
USE **EDUCATIONAL INSTITUTION**
COMPLETED **2018**
SIZE **19.200 M²**
CONSTRUCTION COST **DKK 700 MILL.**

NORTH ATLANTIC MEGA SCHOOL TO ENSURE YOUNG PEOPLE STAY

GLASIR COLLEGE, BIG – BJARKE INGELS GROUP / FUGLARK

The largest educational institution on the Faroe Islands makes it attractive to get an education and stay on the islands. There’s an iconic school building in Tórshavn inviting nature, the local community and young people inside.

Glasir College in Tórshavn is the result of collaboration between the world-renowned architectural firm BIG and local Faroese architects from Fuglark. The school gathers three upper secondary schools under the same glass roof. The building has been placed high on a hillside in a spectacular landscape, which teachers and students can contemplate and access at all times. Glasir College stands out with its transparent design welcoming in the island’s dramatic landscape and opening out to the surroundings. Around 1,500 students and 250 staff use the building on a daily basis, and the architects therefore worked meticulously to perfect the acoustics. The atrium boasts a staircase inspired by the island’s famous rocks and nature, and with a total of 3,100m2 of glass walls and 200 glass doors, the building makes ample use of the unique light for which the islands are also famous. Glasir College creates the right conditions for staying on the islands and getting an education in Tórshavn, thus benefitting the local community and businesses in the long term.



” Students say that now they apply for admission to the programme they actually want to study. Previously they were tempted to base their decision on where their friends were applying, but now they can study whatever they like under the same roof with their friends.

Hanna Ziskason Hansen, Advisor, Ministry of Foreign Affairs and Culture, Faroe Islands



Photo: Rasmus Hørtshøj

Photo: Rasmus Hørtshøj



ARCHITECTURE BASED ON HOW CHILDREN EXPERIENCE SPACES ØRESTAD SCHOOL, KHR ARCHITECTURE

Educational designs frame pupil life at Ørestad School. Spatial organisation, good layout, custom-designed furnishings and easy movement around the building ensure variation for pupils during long school days.

Ørestad School is a municipal primary and lower secondary school with an integrated public library. The building therefore functions as a social and cultural gathering point for the Ørestad district. Teaching and learning not only take place in traditional classrooms, but also in all of the school's rooms and common areas, which can be flexibly adapted to the specific learning situation.

The school embraces the surrounding urban space and pupils and teachers can spend time by the canal and on the terraces of the school building. Views out and in through peepholes in walls, etc. allow pupils and teachers to see the activities taking place in the space, and this makes the youngest as well as new pupils feel safer. The building design brings daylight into the building and allows the building's users to look out onto the urban landscape, where local residents, in turn, can look inside at life and learning at the school.

Intermediary zones and transitions between indoor and outdoor spaces add shortcuts and informal resting areas between different classes and floors. Furthermore, the main stairs are on the outside of the building and connect the school to the local area.



Photo: Kontrast

“You can exit the building without going downstairs, so you can always step outside for fresh air and exercise during the day.”

Flemming Dahlqvist, Vice Principal, Ørestad School



Photo: Kontrast

ARCHITECT KHR ARCHITECTURE
CLIENT CITY OF COPENHAGEN
ENGINEER WSP SWEDEN
CONTRACTOR MT HØJGAARD
LOCATION COPENHAGEN, DENMARK
TYPE SCHOOL
USE PUBLIC SCHOOL AND LIBRARY
COMPLETED 2012
SIZE 14,500 M²
CONSTRUCTION COST DKK 290 MILL.

A wide-angle photograph of a modern school atrium. The space is characterized by its high ceiling with a grid of square acoustic panels and several large, circular pendant lights. A prominent feature is a wide, multi-level wooden staircase with light-colored wood treads and railings. Several people, including children and adults, are seen sitting and walking on the stairs. To the left, a mezzanine level with a glass railing overlooks the main space. The floor is a smooth, light-colored material. The overall atmosphere is bright and open.

LEARNING ENVIRONMENT WITH A LOVE OF NATURE SKOVBAKKE SCHOOL, CEBRA ARCHITECTURE

ARCHITECT CEBRA ARCHITECTURE
LANDSCAPE CEBRA ARCHITECTURE
CLIENT MUNICIPALITY OF ODDER
ENGINEER MT HØJGAARD DESIGN & ENGINEERING
CONTRACTOR MT HØJGAARD
LOCATION ODDER, DENMARK
TYPE NEW BUILDING
USE SCHOOL / DAYCARE CENTRE
COMPLETED 2018
SIZE 9,236 M²
BUDGET DKK 250 MILL.

Photo: Adam Mark



Photo: Adam Mark

The markings in the common areas function as exercise and running tracks as well as fire-escape routes, so if there is an emergency, pupils will already know the escape route.

Skovbakke School in Odder neighbours an urban midtown as well as a forest. A special relationship with nature and a focus on 'zones' have resulted in a flexible learning environment and outdoor teaching.

Skovbakke School is a local hub for school and preschool children. The school's learning environments have been carefully designed to meet the demands of modern teaching methods. Because the school is certified as a profile school under the Danish Gymnastics and Sports Association, movement, play and sports are a natural part of pupils' everyday life, and every classroom has been designed for physical exercise.

The school is open and transparent, and several classrooms have balconies facing onto open green areas. It is easy for teachers to move their teaching outdoors. The school borders a public forest, and therefore it was important for the school to preserve as many of the original trees as possible. The trees that were felled were used to make the school's interior and furniture. The school has been designed with split-level walkways, so that everyone has direct access to the outdoor environment and common areas. Skovbakke School is divided into different zones and spaces of varying size. This means the pupils and teaching can change between working in class, in groups or alone.

The school's energy consumption is communicated to the pupils, and technical installations have been equipped with windows to make them a visible part of the school's interior design. Pupils can therefore learn energy conscious behaviour and contribute actively and visibly to improving the indoor climate and reducing energy consumption.



Photo: Adam Mark



A TEXTBOOK EXAMPLE OF SUSTAINABILITY

COPENHAGEN INTERNATIONAL SCHOOL, C.F. MØLLER ARCHITECTS

Students at Copenhagen International School in Nordhavn are trained for a global future and with focus on sustainability. Innovative and green solutions pervade the building and teaching.

Copenhagen International School in Nordhavn is an innovative flagship for teaching sustainability. The school's around 1,200 students are taught in classrooms and learning environments in which indoor climate and the green transition take centre stage. Most of the classrooms are in the corners of the building to provide daylight from two sides. Where there is a shortage of daylight, LED-based lights have been fitted, which can be regulated according to colour temperature. The school is divided into four 'towers', and each section has its own design, colour and layout adapted to the relevant age group.

There is a play of light in the facade's 12,000 solar panels, and the panels ensure that the sun's energy can be exploited as it moves across the sky during the day. The structurally integrated solar installation is among the largest in the world and it meets more than half of the school's annual electricity demand. The sustainable solutions are a permanent part of physics and math classes at the school, and there is a ban on plastic in the canteen, as well as containers for recycling and 'recycling' classes.

To improve wellbeing and concentration among students and teachers, the CO₂ content and temperature are monitored daily in every class-room, and Copenhagen International School has a well-documented good indoor climate.



Foto: Adam Mørk

”The rooms and the areas dedicated to different age groups have been adapted to the relevant age, and the daylight and indoor climate help improve the learning environment significantly. We have long, often intense, days, so this is important for us.”

Leonie, Student at Copenhagen International School

ARCHITECT C.F. MØLLER ARCHITECTS
 LANDSCAPE C.F. MØLLER ARCHITECTS
 CLIENT PROPERTY FOUNDATION COPENHAGEN INTERNATIONAL SCHOOL
 CONSTRUCTION PER AARSLEFF | EILER THOMSEN ALUFACADER | KONSORTIET KT DTEK
 ENGINEER NIRAS
 LOCATION NORDHAVN, COPENHAGEN, DENMARK
 TYPE NEW BUILDING
 USE SCHOOL
 COMPLETED 2017
 SIZE 26.000 M²
 BUDGET DKK 600 MILL.

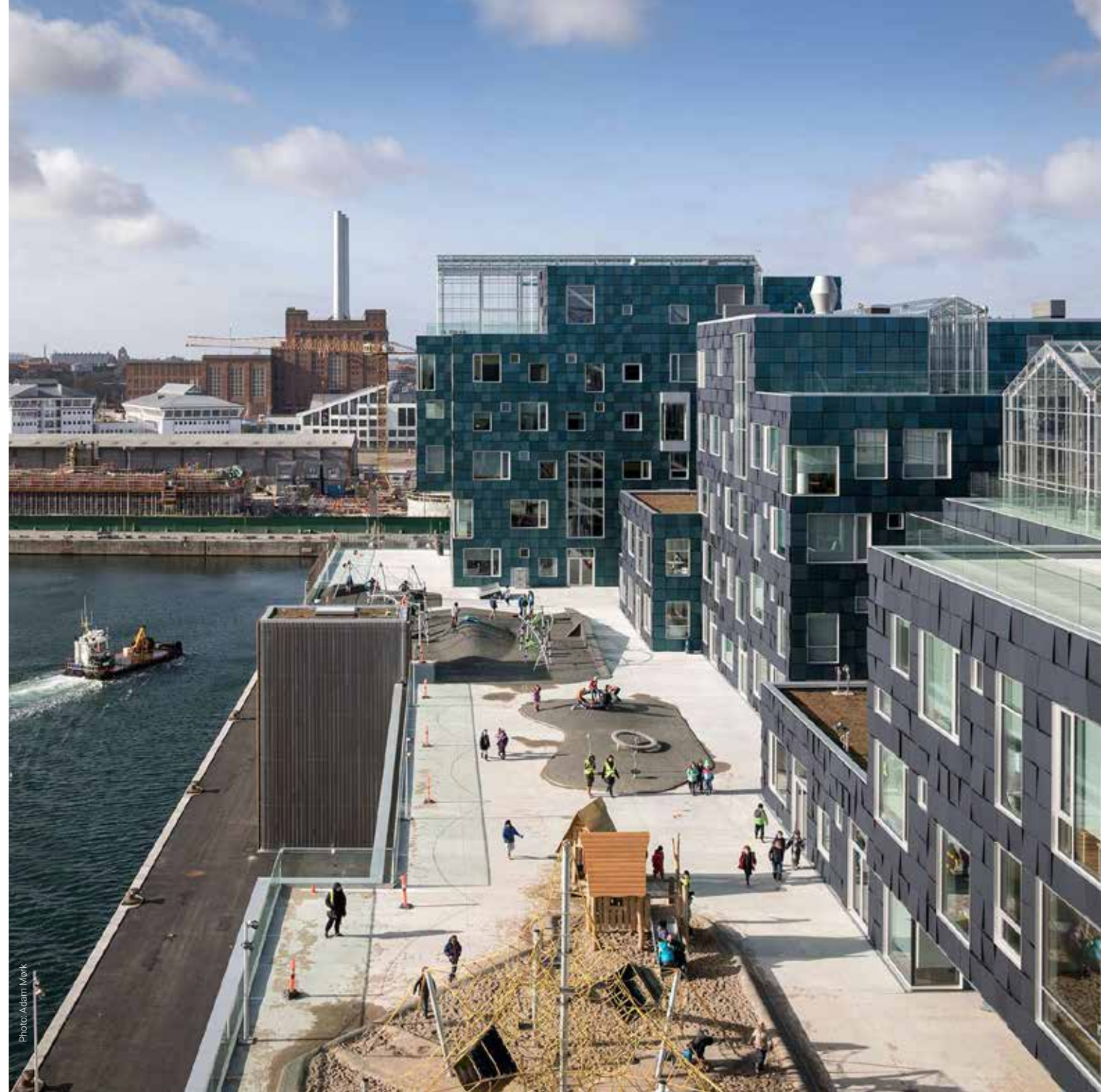


Foto: Adam Mørk



Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all.

”Emotions fuel learning. Without emotions there’d be no learning. All of the knowledge we acquire comes with emotion. What we remember, and how we remember, is determined by emotions. This is one of the reasons why a good learning environment is important.

Læring i praksis (learning in practice), Ole Lauridsen, 2017

Good architecture creates exciting new physical frameworks for communities. Wellbeing is a precondition for learning.

Motivation is essential, and the motivation to learn depends largely on children and young people thriving in their educational environments. Social and academic wellbeing, motivation and co-determination, peace and order are parameters in the Danish Ministry of Education student wellbeing surveys, and the results of these surveys suggest that there is room for improvement. In these surveys, motivation and co-determination score 16% lower than general wellbeing, and 24% lower than social wellbeing. There is great variation between schools, and between municipalities.

“Space is never neutral, because space will always either inhibit or promote our relationships and activities. That’s why we have to take space seriously.”

Kluge Kvadratmeter (intelligent square metres), Andersen & Antorini, 2017

The architecture of buildings sets the framework for learning environments and wellbeing at Danish schools. It’s important that educational architecture offers many different types of more open or less open spaces for concentration, exercise and play. Research shows that flexible spaces that support learning through movement and physical exercise bolster concentration and support social relationship building. The projects in this booklet support sustainable development.

The wellbeing, motivation and learning of children and young people are improved by good physical surroundings. Architecture plays an important role in supporting teaching and learning at educational institutions, from primary and lower secondary schools to universities and university colleges. We have collected a number of examples of educational architecture with innovative solutions that establish stimulating study and work communities for teachers and students, and at the same time contribute to the local area.

See more examples of architecture with added value at www.danskeark.dk

THANKS to all our members
– all the architectural firms for their permission to use their cases
– without you there would be no examples to share!

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