



**CREATING
POWERHOUSES OF LEARNING
THROUGH LIGHT**



ZUMTOBEL

**CREATING LIGHT
CREATES
INSPIRATION**



LIGHT FOR EDUCATION AND SCIENCE



ACTIVE LIGHT CONNECTING WITH NATURE

BACK TO THE ROOTS
THROUGH LIGHT.

Active Light follows the course of natural light. Artificial light modifies the direction, colour and intensity of light, in order to support the natural biorhythm. An effective regeneration alternates with activation phases. Active Light always puts people first. The light adapts to different tasks, expectations and the flexible use of space.

Learning should be fun. With perfect perception, emotional support and health. For well-being, creativity and improved learning processes. This is how schools become powerhouses of learning.

LEARNING AND LIGHT

WHY DO WE NEED DIVERSE
LIGHTING COMPOSITIONS FOR NEW
EDUCATIONAL CONCEPTS?



Learning companions/guides instead of teachers. Individualising rooms and time. This is what new pedagogical/educational concepts look like. With a paradigm shift for the architecture of schools and universities. With new lighting requirements.

- People are looking for their favourite places to learn
- Diversity and appealing to all senses
- Innovative learning concepts no longer fit into the “one size fits all” approach of the age of industrialisation
- Rooms and light must foster creativity
- Learning spaces become living spaces for a positive and successful day

In his twelve educational theories for building schools, the German educator Dr Otto Seydel, Institute of School Development, claims: “In the places where children learn to solve problems independently and freely, flexible, friendly and healthy rooms are needed. Light supports this in many ways. It changes environmental conditions at the touch of a button.”

PARADIGM SHIFT IN LEARNING

FLEXIBLE LIGHT FOR
VERSATILE LEARNING REQUIREMENTS.

	FROM TEACHING TO LEARNING	INFLUENCE ON LIGHT IN EDUCATION
01	Better room quality	Light as a significant and flexible component of learning.
02	Activation and change of perspective	Change of location. Different luminaires and lighting scenes.
03	Learning alone and in groups	Multiple use of space. Use of flexible groups of luminaires.
04	Inclusion	Different visual and emotional lighting requirements.
05	Full-day classes	Connection of exterior and interior space. Light for working and living.
06	Teachers as team players	Light in the fixed teacher's area at the front of the room is becoming less important.
07	New learning tools	Multiple lighting scenes. Better quality and no glare by reflection when using digital devices.
08	Learning in a cultural context	Light as an integral part of teaching. Awareness-raising.
09	Health	Human Centric Lighting. Fusion of daylight and artificial light.
10	Dealing with environment and technology	Light experiments in networked teaching.
11	Democracy	Choice of lighting moods. Light in quiet zones for everyone.
12	A communal sense of openness and connection	Diverging lighting moods in halls. Exterior design using light.

Dr Otto Seydel, German educator and school reformer,
12 theories for building a "future-proof" school



LIGHT AS AN INTERACTIVE TEACHING TOOL

STUDY RESULTS
FROM THE FIELD OF LIGHTING RESEARCH.

In a study by Aalborg University in Copenhagen the interaction with light was investigated within the framework of teaching on the basis of four light scenes. The following motivations for changing the light while learning were evaluated:

- Support and structuring of learning activities
- Influence communication through lighting
- Involvement of schoolchildren in decision-making when it comes to lighting
- Influence on activity level and behaviour
- Creation of a special atmosphere adapted to the activities
- Support for visual tasks and improved visual comfort

Changing the room through light adjustments offers a new interactive teaching tool that supports learning processes.

LIMBIC[®] LIGHTING

MORE THAN JUST
STANDARD LIGHTING.



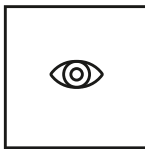
LIGHT FOR EDUCATION AND SCIENCE

Emotions, also triggered by light in the room, have a significant influence on our thinking and behaviour. Positive emotions support the joy of discovering and learning, thus helping people to learn successfully. Dr Rotraut Walden from the University of Koblenz shows that light offers many starting points for better school buildings. She demands:

- Sensory experience
- Privacy for all and visual enhancement
- Better technology (e.g. air, lighting)
- Intelligent buildings with sensors for adapting to people's needs
- In case of stress, overload or fatigue, lighting, acoustics, heating, sun protection, colour etc. should all be individually controllable.
- Relationship with nature and culture
- Sustainability

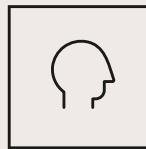
Light for a successful learning process goes far beyond standard lighting. Limbic® Lighting supports the vision of an effective powerhouse of learning. It meets both new educational requirements and people's emotional requirements for their learning environment.

ACTIVE LIGHT WITH THREE LEVELS OF LIGHT QUALITY



STANDARD LIGHTING

Visual impact for comfort



LIMBIC® LIGHTING

Emotional impact for balance



HUMAN CENTRIC LIGHTING

Biological impact on health

ACTIVE LIGHT – LIGHT ALWAYS ACTS ON ALL THREE LEVELS, BUT WITH A DIFFERENT FOCUS.

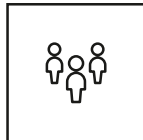
No glare, good contrasts, sufficient shade. Supports perceptual processes such as adaptation to or accommodation of changes in perspective. Standard-based minimum requirements define the framework conditions.

Light is a significant element for perception and emotional spatial support. Emotions triggered by people and spaces have an influence on our behaviour. Positive emotions help people enjoy learning and thus learn successfully.

HCL complements daylight in helping school pupils and teachers be active and recuperate. The right lighting composition at the right time supports natural physical processes throughout the day. The body clock stabilises and sleep quality improves. Promotes healthy and active learning.

The child shouldn't have to adapt to the environment, the environment should adapt to the child.

School: Schule am See, Hard (AT)



670 CHILDREN

360 primary school and 310 secondary school children are taught at the Schule am See in Hard (AT).



9 CLUSTERS

Flexibly used and transparent learning zones give identity and a piece of home. The cluster school offers space for strengthening self-esteem and social competence, through year-over-year learning and different group sizes, accompanied by two teachers per class. Clusters with favourite places for different tasks.



1 POWERHOUSE OF LEARNING

Traditional working and learning is combined with a home-like atmosphere and a high level of satisfaction. Through participation. Class visits and discussions with users, local authorities and associations. That's how architects create powerhouses of learning that can be successfully opened up for communal use.

The look and feel of a living environment and flexible, transparent learning zones help educators and children feel secure and promote both planned and free work. The close cooperation between architects, teachers, parents, children and community associations has created much more than just a school – a communal meeting place has been developed, which, with its flexibility and open learning environment, gives both a new form of education and local associations a home. A powerhouse of identity and of learning.



Schule am See, Hard (AT)

NEW BUILDING WITH INNOVATIVE LIGHT

LIGHT COMBINES ARCHITECTURE
AND NEW EDUCATIONAL APPROACHES.



An innovative architectural and lighting concept that combines the requirements of the traditional learning and living world of an all-day school. Successful participative architecture from Baumschlager Hutter Partners.



Warm white, 2700 Kelvin



Daylight white, 5700 Kelvin

TUNABLEWHITE

Different scenarios, such as a bright, bluish and open or else a reddish, reduced and private light composition invite people in educational institutions to communicate, focus on work, be inspired and recharge their batteries.

Using a control panel or an app, light conditions can be adapted to various activities and requirements. Each form of teaching, such as group working or individual tasks, is supported by the appropriate lighting mood. The large windows in the cluster areas let in natural daylight. Blind control systems prevent heat or glare. By changing the lighting scenes at the touch of a button, the mood of the room can be adapted to various requirements, expectations and work equipment or methods. According to the findings of the Aalborg University Copenhagen, light should be used as a supporting, structuring and interactive element in the classroom.

The higher blue proportion and the increased intensity have an activating effect at certain times of the day and help to focus on during traditional classroom instruction.



CLUSTER AREAS

LIGHT FOR PUPILS' AND TEACHERS' FAVOURITE PLACES.

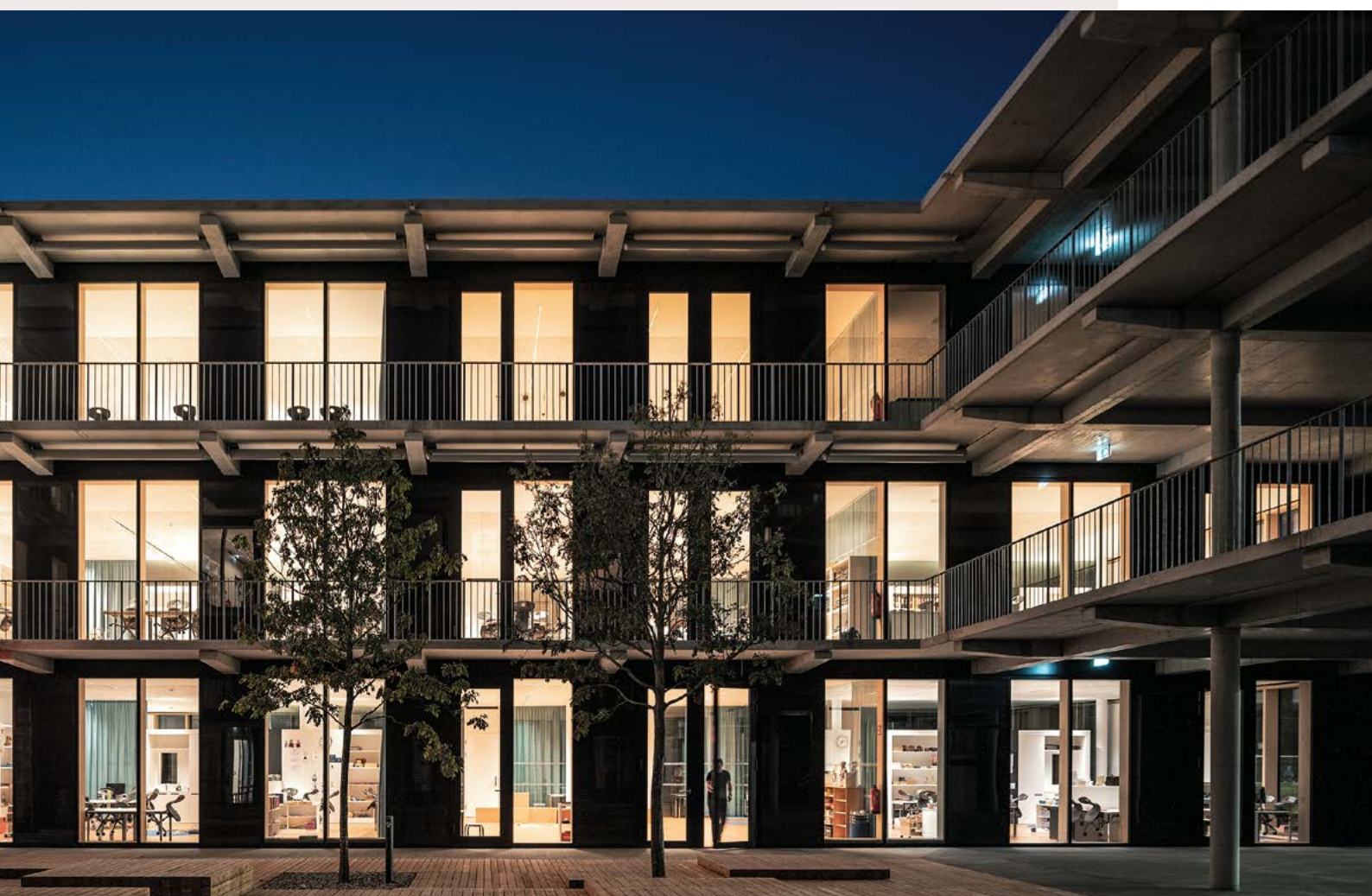
How can changing light colours and moods improve learning outcomes? The technology supports people in two ways. Human-centric lighting supports the body's physical processes: activating and bluish light in the morning, reduced and reddish light in the evening. The objective of Limbic® Lighting, on the other hand, is to focus on the emotions. Reddish light and a living room-like atmosphere encourage tranquility and help to unleash ideas. On the other hand, the room needs various sensory stimuli for different activities, which are provided at the push of a button or in stored timelines.



Higher red-spectrum proportion and dimmed room lighting create a calm and private space. This mood supports reading aloud sessions, prayers, mindfulness breaks and communication.

NEW BUILDING “SCHULE AM SEE”

HARD (AT)

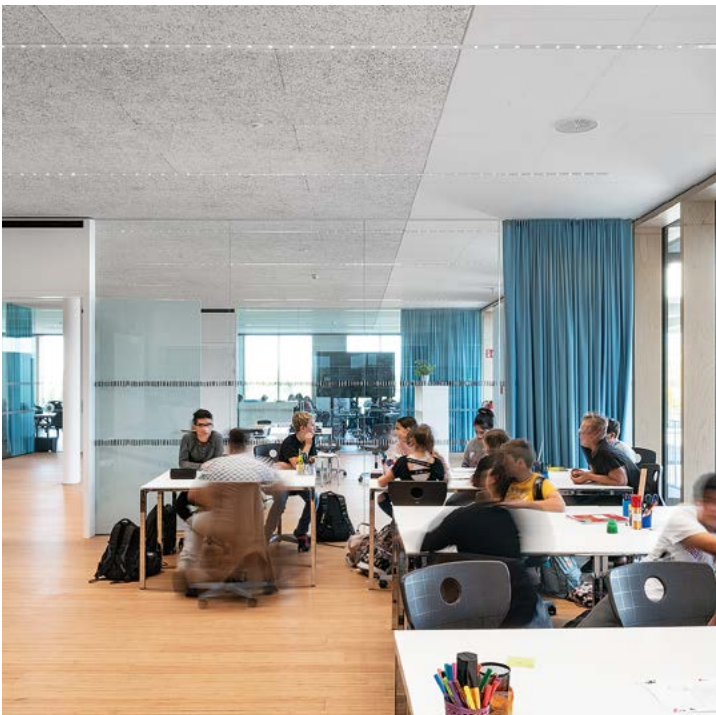


Outdoor areas

LIGHT FOR EDUCATION AND SCIENCE



Subject classrooms



Cluster areas



Entrance halls and stairs

The new primary and secondary school in Vorarlberg's market town of Hard is characterised not only by its innovative educational approach but also by the pioneering lighting solution developed by Baumschlager Hutter Partners, lighting designer Bartenbach GmbH and Zumtobel, which acts as a connecting element for the entire building and subtly integrates into the architecture. The LED lens optic luminaires support perceptual processes and comfort. They structure the lesson using diverging room moods. In addition, the artificial light responds to the natural progression of daylight using Human Centric Lighting recommendations to adapt the light colour and intensity.





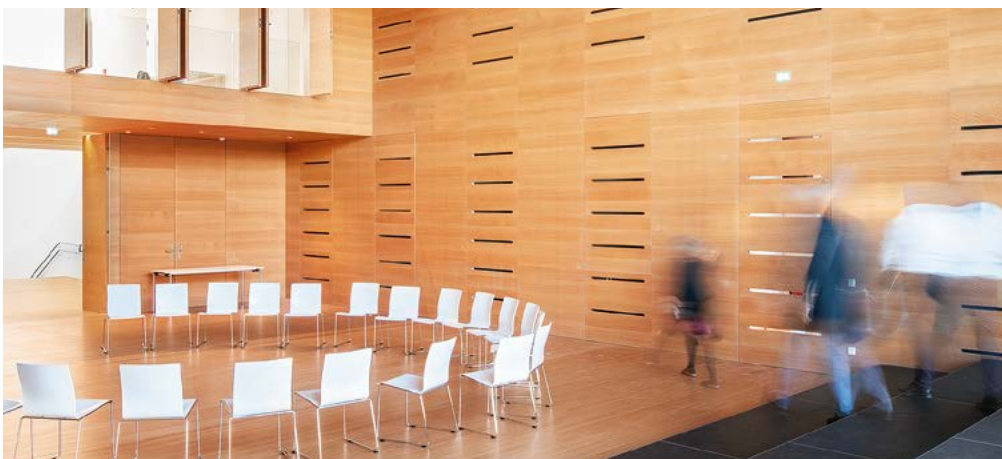
Library



Canteen



Circulation areas and corridors



Assembly hall

REFURBISHMENT “SCHULE HERRENRIED”

HOHENEMS (AT)



Outdoor areas



Corridor that connects the renovated part and the new building wing



Sports hall

The Volkshule (primary school) Herrenried in Hohenems (AT) is a fine example of an energy efficiency upgrade of a school building from the sixties, supplemented by a new wing. The then visionary learning environment still offers the perfect room structure for today's teaching methods – for whole-class groups, group work or concentrated individual work with the freedom to choose the room and working speed. There is now no difference in quality between the existing three-storey class wing and the adjacent new building. With light as the connecting element. The pioneering school has won the best architects 19 award. An inspiring learning environment by the architects doner\matt.





Renovated classroom

The MIREL evolution luminaire family is the perfect choice for replacing lights in existing ceiling structures during refurbishment projects. It is an efficient, glare-free and multi-functional addition to the new building, without being obtrusive.



**62 %
ENERGY SAVINGS**

LED	CONVENTIONAL
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Example: replacement of 4 x 18-watt fluorescent lamps with new LED solution in 600/625 modular ceilings.

TESTIMONIALS



Mannheim Business School (DE)



FHNW Muttenz (CH)



BSA-Akademie Saarbrücken (DE)



Schulhaus Muhen (CH)



Anton Bruckner Privatuniversität, Linz (AT)



Fachhochschule für Tourismus, Villach (AT)

THE LIGHT



Volksschule Lavamünd (AT)



Volksschule Gramatneusiedl (AT)



Herstedlund Skole, Albertslund (DK)



Volksschule Herrenried, Hohenems (AT)



Campus Wirtschaftsuniversität, Vienna (AT)



University of Wales (UK)

PRODUCT RECOMMENDATION

TEACHING AREAS

MIREL evolution



ECOOS



MELLOW LIGHT



LIGHT FIELDS



TECTON



ONDARIA



CLARIS



SLOTLIGHT



CORRIDOR AND ADDITIONAL CLASSROOM LIGHTING

SLOTLIGHT infinity



PANOS infinity



CRAFT



Asymmetrically radiating wallwashers are available as panel lighting in the identical design line.

SPORTS HALLS

LIGHT, CONTROL, EMERGENCY LIGHTING AND SERVICES



Wireless Solutions



Lighting Management



Emergency Lighting



Finance Services

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