

Back to school with circadian lighting for health

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A school in Norway is pioneering a new LED circadian lighting system, which is aimed at improving pupils' performance, relaxation and wellbeing. James Hunt reports:



Kongsgardmoen School in Kongsberg has installed LED lighting with fully adjustable colour temperature, allowing teachers to tune from cool white to warm white.
-Lux Magazine

The school, which has been working closely with lighting researchers and scientists, has just welcomed in 230 primary school pupils. The aim of the circadian lighting system is to understand whether this tuneable LED lighting genuinely can change the school kids' behaviour and improve their academic performance.

It is believed to be one of the first schools to install a full circadian lighting system throughout.

To this effect, the school - Kongsgardmoen School in Kongsberg - has installed LED lighting with fully adjustable colour temperature, allowing teachers to tune from cool white to warm white. When the children arrive in the morning, their first class is illuminated by cool white and intensive energy light.

This cool white light regulates the production of stress and sleep hormones in the children's (and teacher's) bodies. The light shifts their daily rhythms forward, making them more active during the day and tired when the night falls; improving children's sleep patterns.

Matching circadian rhythms

The reason for installing this type of lighting system is to optimise it to the children's circadian rhythms, which are biological rhythms that repeat about every 24 hours. Exposure to the natural sunrise and sunset synchronises human circadian rhythms to

exactly 24 hours. Circadian disruption has been associated with increased risks for breast cancer, diabetes, obesity, heart disease, sleep disorders, and other ailments.

One definition of 'circadian light' is 'spectrally weighted retinal irradiance that stimulates the human circadian system'. It is this that the lighting system in Kongsgardmoen School tries to emulate.

Colour tuning and high colour rendering

The colour rendering of the light is very high at over Ra90. This is apparently much higher than the minimum requirements for school lighting in Norway, and it makes colouring, reading and writing easier and more pleasant.

The standard setting is neutral white, which is a good working light. However, teachers can activate other modes for specific tasks or tune the light, which is easily achieved using wall-mounted user panels.

Part of the lighting cycle is automated in order to ensure that the required biological effects, especially in the mornings, are correctly achieved. However, a focus light mode can be activated for tasks needing extra concentration – taking exams is a good example of when this would be required. Cool white and intensive light, for example, increases short-term concentration and alertness.

A relaxing mode can be switched on when (for example) pupils gather at the front of the classroom to listen to the teacher telling a story. In this mode, warm white light creates a pleasant, relaxing atmosphere. The teachers are trained to use the sophisticated system and as time goes on the research will show the best times to activate specific lighting modes.

Time will tell as to whether this school LED circadian lighting system actually benefits the school kids and their work, but there are concerns in the UK. For example, there are said to be currently no guidance levels for the basic requirement of lighting stimulus for healthy centric and circadian systems. For this reason, some believe that schools may not be the best places to experiment with.

Sources – various – but mainly Lux Magazine

Article: <http://www.voltimum.co.uk/articles/back-school-circadian-lighting-health>

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