Education
Resource
Guide

How technology can help improve built environments

in schools and educational facilities

TREND

Technology plays an important role in educational buildings

How can building technology support the improvement of learning spaces?

A Building Energy Management System (BEMS) is a solution designed to automate building operations and deliver greater comfort control.

Good indoor air quality is a classic example. It's important to check whether existing building management systems function fully and effectively for students, teachers, staff and visitors.

BEMS technology enables smarter buildings and can assist facility managers in many aspects of their reliability, productivity and environmental goals.

Even when school's out, a BEMS can provide remote monitoring of HVAC systems, reducing the need for on-site personnel and maintenance.

Ultimately, a BEMS is ready to support strategic building operations such as optimising occupant comfort, managing energy or progressing toward sustainability goals.

Introduction

An average adult takes about 12-16 breaths per minute. Children breathe even faster. Newborns can take 40 breaths per minute. Yet the air we breathe can be filled with pollutants, pathogens and allergens. Although the body can filter smaller amounts of pollutants, it can't cope with larger amounts or coarse (bigger) particles, known as $PM_{10.}$

A survey conducted by Honeywell found that education facility managers are more willing to invest in smart building solutions compared to their prepandemic priorities.

Breathing poor quality air is known to be harmful to people, not only outdoors but also in buildings where air exchange is limited.

Although it may be challenging to improve outdoor air quality, building technology makes it possible to monitor HVAC systems with more precision and improve indoor air quality with better control.

Good quality air indoors is known to have a positive impact on the wellbeing of building occupants.

And this is especially true in schools and universities.

In some areas, the level of hazardous pollutants in indoor air have been found to be greater than those found in outdoor air.

In 2015, the World Health Assembly adopted a landmark resolution on air quality guidelines, recognising the global nature of the challenge and the need for an enhanced response.[1]

Facility managers must implement strategies that are fit for purpose and can adapt to the changing needs of users.

A BEMS, therefore, offers a practical solution to enable greater visibility and control of your building's HVAC systems using easy automation and open integration. This means that students as well as staff and visitors can feel more comfortable in their learning environment.

1 WHO global air quality guidelines. "Particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide." Geneva: World Health Organization; 2021. Licence: CC BY-NC-SA 3.0 IGO.
https://www.who.int/publications/i/item/9789240034228

Challenges in Education

The COVID-19 pandemic has shown that education systems must be better prepared for sudden changes to their mode of operation.

That has been supported, in part, by shifting to remote working, hybrid teaching and digital collaboration models.

Moreover, these tools have revealed various strengths and weaknesses of teaching conducted without direct student contact.

As we adjust to a new normal, taking lessons from recent events, protecting the wellbeing of students and staff remains a priority.

Considering your building, it would be worthwhile asking the following questions:

- Do I have complete and accurate information on air quality in my building?
- Does my building have the ventilation systems to support the comfort and wellbeing of students, teachers and administration staff?

Facility managers, by answering these questions, can begin the process of evaluating the air quality systems installed in their buildings and assessing their performance against industry benchmarks.

Air quality in schools and universities must be frequently monitored and optimised.

Do my systems meet air quality requirements?

- Do they adequately address the needs of users?
- Do they require modernisation or upgrading?
- Do they need new components or functions?

Smart-ready solutions

Trend's BEMS are designed to improve performance by intelligently monitoring and controlling your building services, helping to keep a closer eye on processes and supporting a built environment that puts people first.

OPTIMISE HUMIDITY

High humidity levels favour the growth of bacteria and mould, potentially creating an environment in which dust mites can thrive.

Low humidity may result in problems such as dry, itchy skin, higher risk of virus transmission and irritation to the upper respiratory tract.

ENHANCE CLEAN AIR SUPPLY

Supplying fresh air flow is a key factor for enhancing the air quality of built environments.

This involves monitoring odours, chemicals and carbon dioxide levels, and then adjusting settings to maintain optimal conditions.

A BEMS can supplement fresh air supply with a goal to optimise the indoor climate in classrooms, helping to reduce suboptimal comfort levels.

Heating, Ventilation and Air Conditioning (HVAC) solutions, in addition to monitoring and filtration technology, can aid the the improvement of air quality in buildings.

The right solution for your campus could include filtering the air to controlling its temperature, humidity, air quality and pressurisation.

Trend Control Systems Ltd offers cost-effective technologies to improve control regimes for educational spaces with a special focus on air quality and energy management.

ADDING ADVANCED AIR FILTRATION

From bacteria control to particulate matter, filtration systems can remove airborne contaminants in individual rooms before they start circulating throughout the facility.

CREATING PROPER AIR PRESSURE

Maintaining a stable negative level of pressure in a room can support efficient re-circulation and improve air exchange, providing a healthier environment. It also reduces the spread of airborne pathogens.

ACHIEVING THERMAL COMFORT

Optimal temperature can support comfort and wellbeing. Information about the temperature changes allows you to react quickly, even before anyone reports that a room is too warm or cold.

DEPLOYING 24/7 FACILITY MONITORING

A BEMS allows you to observe factors that impact air quality and overall building health. Remote connectivity means you can track changes and make adjustments in real time.

Cost-effective solutions

At Trend, we develop solutions to help facility staff improve air quality, from design and installation to aftercare and expansion.

Our solutions for educational buildings work holistically to integrate HVAC, air quality monitoring and air filtering systems. Additionally, they're engineered for compatibility with other BEMS components and third-party devices.

In particular, a Trend BEMS can automate maintenance activities and make it much easier to coordinate systems.

In most cases, the focus will be on two elements: indoor air quality sensors (IAQs) and digital monitoring platforms.

The first step to improving air quality is to collect data about current environmental conditions. Trend's IAQs can track climate parameters and communicate this data to the BEMS. The BEMS can then provide visualised data with actionable feedback for improvements. Our offerings include IAQs that measure a single parameter to all-in-one sensors that can gauge temperature, humidity, carbon dioxide, particulate matter and volatie organic compounds (VOCs).

Once the environment's state is known, the right equipment is needed to maintain or improve conditions.

For example, mobile air purifiers with HEPA filters can capture particles as small as 0.3 microns.[2]

They can operate independently of HVAC systems and are particularly useful in buildings that don't have forced air heating or ventilation.

The Healthy Buildings Dashboard solution is designed for site-wide energy management and comfort control.

Think of it like a health tracker, but instead of a coach, you get a graphical display for your building's facilities.

The dashboard calculates a score that enables users to understand their building's key perfomance indicators in a user-friendly way. It can be delivered ready to use or customised to your requirements.

The Healthy Buildings Dashboard provides an indication of comfort conditions and environment safety by calculating average values at zone level.

Importantly, the platform has been developed to meet industry standards and guidelines from independent organisations, such as ASHRAE (The American Society of Heating, Refrigerating and Air-Conditioning Engineers), REHVA (Representatives of European Heating and Ventilation Associations) and CIBSE (Chartered Institution of Building Services Engineers).

2. U.S. Environmental Protection Agency. "What is a HEPA Filter?" https://www.epa.gov/indoor-air-quality-iaq/what-hepa-filter-1

Conclusion

The built environments of educational buildings could be enhanced by smart-ready, cost-effective solutions.

With Trend Control Systems, you gain the technology designed for a clear view and better control of indoor air quality and energy management.

This helps provide a deeper understanding of your building's possible issues along with the increased knowledge to prioritise corrective actions.

WANT TO LEARN MORE?

Visit our website to find more smart solutions to help your building advance learning.

ABOUT TREND CONTROL SYSTEMS

With a worldwide distribution and support network covering more than 50 countries, Trend Control Systems is a major international supplier of Building Energy Management Systems (BEMS).

Trend's BEMS are supplied, engineered and commissioned by approved systems integrators. Trend Control Systems is part of Honeywell Building Technologies.

For more information

Please contact your Trend consultant.

Or visit trendcontrols.com.

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