

Lighting

Lighting is one of the most important of all building systems, according to the National Lighting Bureau. Every school relies on lighting to provide an effective learning environment, which is one of the most critical physical characteristics of the classroom.

The modern classroom is a space where a wide range of teaching/learning activities take place. These include traditional blackboard tasks, individual desk work, computer work, audio-visual presentations, fine arts, sewing, the use of visual aids on the walls and more. Ample lighting is crucial for sight-impaired students or for students who use dangerous equipment such as lathes or saws in shop classes. Key issues are visual comfort and providing appropriate light levels for all the various tasks and activities that take place in the classroom. Classroom lighting needs to provide teachers with the ability to change the lighting in response to the visual needs of each type of activity.

Indoor lighting should achieve the desired appearance and ambience in the space as well as meet many other important functional and psychological needs. Educators have noticed how lighting affects students' behavior, alertness and ability to learn. Classroom lighting plays a particular role because of the direct relationship between good lighting and students' performance. Bad lighting leads to discomfort and hyperactivity, while better lighting produces greater productivity. Teachers have also noted that lighting affected their own effectiveness in the classroom and their ability to handle the stresses of the teaching profession. Lighting can have a significant impact both on student and teacher productivity.

The visual environment affects a learner's ability to perceive visual stimuli and affects his/her mental attitude and thus, performance. Research has shown the effect of illuminance on output for a number of practical tasks such as reading, counting and measuring. All of the results showed that as illuminance increased, time was needed to carry out each task decreased. Studies involving proofreading and number comparison showed that performance improved significantly with increasing illuminance.

Many experts agree that the best approach to classroom lighting is a balance of indirect (up) light, which is light reflected from the ceiling that provides uniform ambient illumination throughout the space and controlled direct (down) light, to provide enhanced visibility for reading and writing tasks.

One approach to classroom lighting that has gained wider acceptance in recent years is creating instructional spaces that rely on daylight for illumination. While natural illumination from windows and skylights is a preferred standard, most learning environments will require supplemental electric lighting. The Illumination Engineering Society recommends a minimum of one window per instructional space because it increases the quality of the educational environment. It is evident that lighting and windows play a significant role in the achievements of students; however, daylight in some poorly designed instructional spaces may enter the room too directly and create glare, which can hinder learning. Generally, when people sense the lighting system is causing visual discomfort, the problem is poor lighting quality.

Integrating a building's daylight strategy with the electrical lighting system is critical to achieving energy savings. The type of lighting equipment selected for a school can increase energy efficiency. Other methods of enhancing the use of daylight while increasing the effectiveness of a daylight plan are: skylights, clerestory windows, roof monitors and a roof design that diffuses light throughout an area.

In addition to lighting needed for sporting events, outdoor lighting should not be overlooked. Ample outdoor lighting is needed for safety and security. Also, in the food service areas, lighting can have a significant impact of food safety and inspections are performed in accordance with the Ohio Uniform Food Safety Code and the National School Lunch Act.

Experts agree that the lighting of a school should be considered an active element of the total education environment. Good lighting contributes significantly to the aesthetics and psychological character of the learning space. The appropriate visual environment for learning tasks deserves careful consideration. As school districts learn more about sustainable design and other energy-saving techniques, they can keep buildings well lighted and reduce the burden on their budgets.

The best practice is to invest the time and resources necessary to carefully analyze all the factors involved in your impending lighting purchase. For lighting assessments or system design, consult with a lighting expert or illumination engineer. This additional effort in the short term will be well worth it when your school gains a lighting system that meets all necessary requirements, yet affords cost control and quality.

Frequently called the House Bill 264 Program (after the 1985 law that created this financing mechanism), the Energy Conservation Program gives districts the ability, in this one limited instance, to borrow funds for lighting work without having to pass a ballot issue for the authority to borrow. This limited borrowing authority has given districts the ability to save millions in utility bills and operating costs and at no additional taxpayer expense. The types of authorized improvements provided for under this bill allows for replacement or modification of lighting fixtures to increase illumination if necessary to conform to the applicable state or local building codes for the proposed lighting system and any other modification, installation or remodeling approved by the Ohio School Facilities Commission.