



Energy Center of Wisconsin Monitoring and Evaluation of Daylighting in Schools

S U C C E S S S T O R Y

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The Challenge

Nearly 55 million people, or 20% of the nation's population, spend their days inside elementary or secondary school buildings. Well-designed lighting, including daylighting, can have an important impact on the educational experience of students. If properly applied, it can improve the educational environment while at the same time reducing energy usage. What is the experience of teachers, administrators, and students using daylighting in classrooms and is it a potential cost-saving measure?

Technology Demonstration

Human factors and energy efficiency evaluations were conducted at four schools using daylighting features — 1 urban elementary school in WI; 1 suburban intermediate school in CA; 1 rural high school in IA; and 1 suburban elementary school in CO.

Human factors evaluations had the following summary findings:

- Tinted glass is considered visually comfortable
- Shading devices are necessary
- Blinds that need manual adjustments and are difficult to access defeat daylighting purposes
- All four schools found their classrooms visually comfortable, bright and cheerful
- Occupants generally consider their classrooms to be superior to non-daylit rooms

Cost and energy savings findings:

- Daylighting is recommended as a no or low-first cost, simple approach for schools; low or no-first-cost is achieved through incorporation of a downsized HVAC system.
- Potential savings of nearly 25% on operating costs
- Significant potential for reduced lighting and HVAC operating costs — as well as upfront capital costs for chillers-through careful attention to glazing characteristics and lighting configuration.

Daylighting Success Requires that

- Light sensors must be properly located and maintained
- Dimming controls must be compatible with light sensors
- Daylighting controls must be user-friendly
- Teachers and administrators must be trained and buy in to daylighting concepts
- Various uses of the classroom, such as darkening for audio-visual equipment must be considered
- East/West orientation to maximize north/south natural light