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REPORTER'S NOTEBOOK

## School Facility Planners Hear Researchers' Case for Auditory Systems

*Baltimore*

Want to improve learning in elementary schools? Try installing speakers in ceilings and giving microphones to students.

At least that's the conclusion of new research presented at a recent seminar here showing that elementary students in classrooms that were equipped with sound systems that projected their teachers voices performed better on assessments than their peers in classrooms that were not similarly enhanced.

About 120 school architects and facility planners from across the United States and Canada gathered here June 3-4 for sessions on the latest trends and research in school design. The seminar was co-sponsored by the Scottsdale, Ariz.-based Council of School Facility Planners International and Johns Hopkins University's school of professional studies in business and education in Baltimore. Those groups hope to jointly host a series of regular events on school construction and design.

A classroom auditory system, which includes speakers set throughout the ceiling, a wireless microphone worn around the teacher's neck, and wireless microphones passed among students, does not make voices louder, said Paul J. McCarty, an adjunct professor of psychology at Brigham Young University in Provo, Utah, and a co-author of the study. Instead, he said, the system spreads sound evenly throughout the room so that students in the back can hear just as well as those sitting closer to the instructor.

Children's hearing does not fully develop until around age 15, Mr. McCarty said. Younger students have trouble picking up all the words in a sentence, and children tend to tune out instruction when they can't hear well, he added.

Mr. McCarty's research showed that over a four-year period, students in Salt Lake City classrooms that had auditory enhancements scored 10 percent to 15 percent or higher on state assessments than students in other classrooms. English-language learners saw some of the greatest test-score gains.

In addition, teachers vocal chords were less strained, Mr. McCarty said, when they used the microphones. It costs about \$1,500 to install a speaker system in a classroom, he said.

In addition to classroom acoustics, daylight and indoor-air quality make up the three-legged stool that are basic components for a good learning environment, said John C. Rollow, the standards technical director for the 720,000-student Los Angeles Unified School District and the co-author of the study.

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There are plenty of other factors to consider in designing a school. Some of the trends discussed at the seminar include designs that promote greater community use of school facilities, the creation of small schools within larger settings, and high performance features that are environmentally friendly.

School designs are becoming more complex, said Kenneth East, a senior associate with the EdDesigns Group in Fort Lauderdale, Fla. He said that schools in his region are being built with more complex air-conditioning and ventilation systems to combat increasing problems with mold and mildew.

And while security remains a pressing concern, one of the simplest security enhancements can be building corridors of single-stall restrooms. Schools that have those individual facilities have virtually eliminated the discipline problems surrounding large gang restrooms, several panelists said.

Because technology, teaching styles, and the needs of buildings occupants will change, participants here said, architects need to create buildings that provide as much flexibility as possible.

Often, a model school quickly becomes outdated, said Katherine Clark, the principal of Ocoee Middle School in Ocoee, Fla.

Many times we see schools built as a model for something, and that stays true for only the first year it open, she said.

— **Joetta L. Sack**