# Sounds Like A Winner

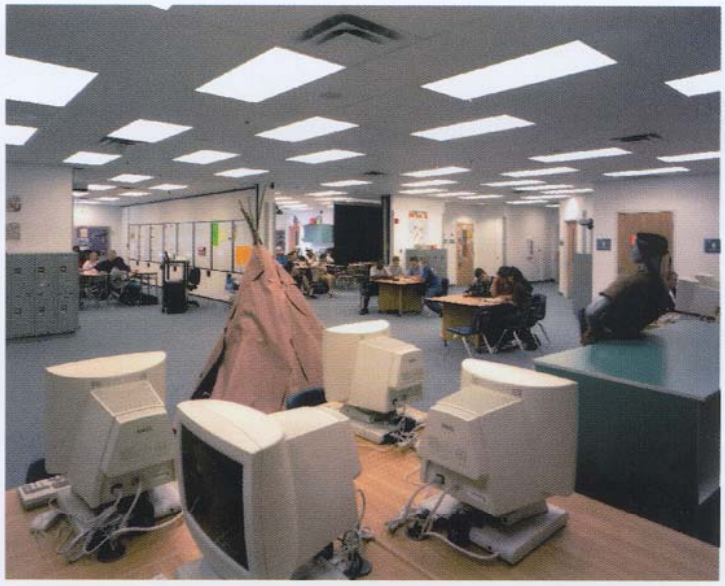
***Improving the ability of students to hear in classrooms also improves their attention levels and, surprisingly, their conduct.***

*by Robbin M. Rittner-Heir*

For about $16 million you can build a school. But if you take that same $16 million, add a lot of forward, beyond-the-boundaries thinking and up-to-the-minute technology, you can create what may emerge as the school of the 21st century. It's architecturally and technologically advanced and caters to both a "normal" student population and those who are hearing impaired. It is a place where students are more attentive and open to learning, and discipline problems are reduced by a staggering 40 percent.

That was the idea behind the replacement of Ocoee Middle School, located near Orlando, Florida — to prove that a school could be designed and built with the latest innovations and still cost no more to construct than a traditional school. The multi-building campus is slated for completion by summer 2001, but the school's sixth through eighth grades are already using newly designed classrooms.

After just a few months of use, initial indications are that this futuristic "Demonstration School" will be a stunning success.



***Ocoee Middle School, near Orlando, Fla., is not your traditional school. The classroom walls move, and teachers wear wireless microphones, making it easier for students, both hearing impaired and those without disabilities, to hear instructions.***

## Why Ocoee?

According to Ocoee Middle School's principal, Kate Clark, a 1997 legislative initiative caused the state of Florida to begin to identify overcrowded schools. Ocoee was found to be 100 percent overcrowded, particularly since some of the buildings on the school's campus were not up to state code and could not be included as part of the usable educational space.

The legislative initiative also created the state's "Soundly Made, Accountable, Reasonable and Thrifty" (SMART) Schools Clearinghouse, which was given the mandate to "develop and con-

tinuously update design and performance standards for functional and frugal school buildings that are space efficient and technology rich."

Ocoee Middle School was chosen to be the state's Demonstration School for the new SMART Schools initiative. A collaborative design committee, including Clark; SMART Schools Clearinghouse representatives; Larry Rosen, president of the EdDesigns Group; and architect Rene Tercilla, then a principal of Fanning Howey Associates, was named to formulate the wants and needs of the new and improved middle school.

## The Making of a Sound School

Improved sound quality and noise reduction were at the top of the list of design factors wanted for the new facility. In fact, Ocoee's teachers ranked audio enhancement as the number one technology desired for inclusion in the school's design, says Jeff Anderson, vice president for sales of Utah-based Audio Enhancement.

Ocoee currently has one hearing-impaired student attending the school. Though the school is not specifically

## THE SCHOOL OF THE FUTURE

Creating the new Ocoee Middle School as the SMART school of the future took a large amount of introspection and collaborative design work. Looking at middle school children's developmental needs played a large role in the school's design, says Kate Clark, Ocoee Middle School's principal.

"We talked philosophy, we talked about what we had seen and hadn't seen," says Rene Tercilla, the school's architect, who currently is a principal of Florida-based Tercilla Courtemanche Watson, Inc. He adds that, according to the National Middle School Association, students in that age group respond best to team teaching, cooperative learning and a more hands-on approach.

Unlike the dubious "open space" school plans of the late 1960s and early 1970s, which were plagued by light and noise pollution, educational planner Larry Rosen, president of the Florida-based EdDesigns Group, says that "you have a school that can open up," so that teachers can combine classes "to facilitate integrated learning."

This design groups classrooms that have a relationship to each other, and students spend most of their time in that space. "The moveable walls chosen for the school's classroom design were driven by a need to be extremely flexible in how teachers delivered their instruction," Tercilla says.

Vinyl-clad wall panels slide within tracks, fold into three-foot sections and store compactly to open up the classrooms. When the walls are locked in place, each section has a usable white marker board and a window overlooking central areas. The walls are moved easily within a matter of seconds. Flexibility was the upside to the design. The only disadvantage was the cost of the moveable wall panels; however, creative design considerations helped to make up for those dollars spent.

### Cutting Costs Without Cutting Corners

To save money, Ocoee did away with what Rosen calls the "showplace" entrance to the school, opting for a more modest entrance area.

Another element eliminated to save money was hallways, Rosen says. Instead, "common areas" were created. Students enter the common area, which is set up as a quad, via a secure vestibule using proximity cards, and classrooms are accessed from the common area. (Ocoee Middle School's proximity cards will be featured in the February issue of *School Planning & Management*.)

Student lockers, study and work areas, and restrooms also are located in the common area, establishing a community environment, while keeping students from having to wander hallways. Teachers also have their own planning area off the common area.

One major asset to this design, Clark says, is that it provides "line of sight supervision" of the students. Essentially, all the teachers in each grade know and can keep track of all the students in that grade.

In addition, all the classrooms have exterior walls with windows to allow for natural light, which Clark says affects student learning. Also included is some full-spectrum lighting.

According to Tercilla, oxygen levels in the classroom also affect the students' ability to focus and learn. As a result, the school's air conditioning system is fitted to monitor changes in the oxygen levels throughout the day.

Fixed furnishings, such as cabinets, bookcases and computer desks are located on permanent walls within each classroom. Desks and other work surfaces are moveable and may be configured to whatever is required according to planned lessons or work groups desired.

The result of scaling down on construction costs is that it has allowed Ocoee Middle School to be "packed" with technology that benefits both teachers and students.

### Juicing Up the Technology

Along with audio enhancement, each classroom is outfitted with a ceiling-mounted LCD projector. Instead of straining to see a picture on a television atop a media cart, students view images on a six-foot-wide image area that can be seen from anywhere in the classroom. Sound from the projection system is run through the classroom's enhanced audio system.

"This is the first K-12 school to have a projector and audio enhancement in every classroom," Rosen notes. "The idea is that every child would be able to see and every child would be able to hear," Clark adds.

Computer use figured heavily into the school's design. The school has more computers than average and hard wiring for connections, but also is set up for wireless capability.

### Quantifying Success

Though the hard numbers of student test scores won't be available for a while, "the decrease in discipline problems alone was obvious," says Clark. She notes there has been a 40 percent decline in discipline incidents from just a year ago, which she attributes to the increased ability of students to focus and remain on task.

In addition, teachers are reporting less fatigue and greater student attentiveness.

"We looked at this as the school of the future," Clark explains. "The impact for students and teachers has been unbelievable."

designing for the hearing impaired, the design team wanted to make the classroom environment more conducive to hearing, thereby improving learning.

To achieve this was no small feat, since all the classrooms were designed with moveable walls, allowing the creation of "learning neighborhoods," where classrooms could be combined for group learning. The moveable walls were chosen to allow the maximum amount of flexibility, Rosen says.

In addition to using moveable wall panels with the sound-blocking capability of fixed walls, Ocoee Middle School became the first school to use an infrared audio enhancement system in every classroom. The classroom infrared technology has been out for only about two years, Anderson says.

Teachers are outfitted with wireless microphones connected to body-worn transmitters, which send an infrared signal to a receiver/amplifier in the room, he explains. Speakers, mounted in the acoustical tiles of the classroom ceiling, are hard-wired to the receiver/amplifier to project the sound.

While the noise level in the classroom itself remains the same, at approximately 40-60 decibels, the teacher's voice is amplified about 10-12 decibels above those noise levels, allowing the teacher to speak in a normal tone of voice. The sound, because of the ceiling-mounted speakers, drops rather than traveling in straight lines and reverberating off the walls.

For someone with profound hearing impairment, Anderson says a personal FM system can be hooked up to the room's amplification system, delivering sound directly to that child's hearing apparatus.

Tercilla notes that teachers have questioned how the designers managed to lower the noise levels in the classroom. His response is, they didn't, directly. Because students are able to hear, they're more attentive and less likely to be causing unwanted noise.

## Retrofitting and Other Options

Ocoee Middle School was outfitted with the latest infrared technology, Anderson says, since the older standard FM audio enhancement system would have allowed bleed-over of sound signals; however, that system still is viable in older schools and if every room isn't being wired.

Though easier to incorporate into new construction, retrofitting existing traditional schools is simple enough, Anderson says. Ceiling-mount speakers generally won't work well in older classrooms with 12-foot ceilings, but speakers can be wall-mounted and used in clusters.

As a matter of fact, the audio enhancement system was first tested in the old Ocoee Middle School building, in both hard floor and carpeted classrooms. In the end, "the teachers wouldn't turn the systems loose," he notes.

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