

Larcey finds that amplifying her students' voices when they read aloud helps the rest of the class focus

lic school the year after amplification began, though no other changes were made. Proponents

like University of Akron audiologist Carol Flexer says the technology's greatest bang for the buck may come during early childhood when reading skills and phonics are introduced. "Without the even distribution of sound in the room from these systems, it can be hard for children to hear the difference between *watch* or *wash* or *wasp*," says Flexer. Her small but influential 2002 study published in the *Hearing Journal* found that 78% of preschoolers and kindergartners in sound-amplified classrooms scored above the mean on a key prereading skills test, compared with just 17% in a comparable group without the technology.

The benefits are grounded in biology, says Flexer. The brain's auditory networks are not fully developed until about age 15, so kids require a quieter environment and a louder signal than do adults when absorbing spoken information. Flexer has found that special-education referrals are fewer in classrooms that are wired for sound, compared with ordinary classrooms, where background noise and distractions compete with the teacher's voice. She believes a sound system is as vital to learning as adequate lighting.

While many school districts remain unfamiliar with the technology, Ohio is ahead of the sound curve. Prompted by Flexer's work, the state has required since 2003 that districts using state funds to build or renovate schools include sound amplification in their construction plans. Districts in other states are beginning to get on board. Last year Audio Enhancement of Bluffdale, Utah, the leading U.S. vendor of classroom sound systems, sold 15,000 of them, up from 7,000 in 2002. Typical cost per classroom: \$1,500. Reno, Nev., has added the devices to 52 schools over the past two years, and Palm Beach County, Fla., is using a federal grant to pay for systems in 27 poorly performing schools.

For some teachers, including Adam Loreda of Chicago's Horace Mann Elementary, there's an unexpected bonus to using a microphone: "My throat stopped being sore at the end of every workday." ■

Now Hear This

Research suggests that kids absorb lessons better when their classroom is wired for sound

By WENDY COLE WESTLAKE

TWENTY PAIRS OF EYES eagerly converge on Jennifer Larcey as the afternoon science lesson gets under way at Bassett Elementary in suburban Cleveland, Ohio. Sure, the transfixed first-graders are salivating at the prospect of examining—and tasting—the physical properties of peanuts, raisins and M&Ms. But something else is riveting the kids, even as Larcey stands to the side of the room issuing directions: the breathtaking clarity of her voice. "Feel the peanuts, and

try to describe the texture," she instructs.

Larcey is one of seven teachers at Bassett who are, in effect, wired for sound. Nearly every word to her students is amplified through speakers wirelessly linked to a small blue transmitter dangling from her neck. Because she began using the technology three years ago, Larcey barely notices the device, except for the rare instances when she forgets to switch it on. "It's obvious. The kids just don't pay attention in the same way," she says. Bassett has joined the growing ranks of schools embracing a deceptively simple technology at

a time when federal No Child Left Behind accountability standards are compelling districts to find new ways to boost academic performance. Although amplification systems have long been used to help hearing-impaired students, recent research has shown that enhanced audio benefits all students by helping a teacher's voice get through loud and clear, even at the back of the classroom.

A 2002 Brigham Young University study found that standardized test scores for fourth- and fifth-graders rose from 10% to 15% in every subject at a Utah pub-

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