

A Pioneer in Classroom Audio Technology

An In-Depth Interview with Dr. Carol Flexer

*Interview conducted by Bruce Bebb, Marketing Communications Director,
Lightspeed Technologies*

For over 20 years Carol Flexer has researched, advocated and promoted the theory and practice of classroom audio technology

around the globe. Her passion to help children learn better by improving classroom acoustics and the implementation of classroom audio is based on solid research and personal experience. This quick and informative read answers the most common questions asked by educators seeking real solutions to real problems.

“What classroom audio offers is proven results without changing curricula or teaching methodology”

—Carol Flexer

Classroom audio systems help to level the playing field, allowing every child an opportunity to clearly hear spoken instructions.

“A Lightspeed system was installed in my room at the beginning of the year. I can now talk in a low, speaking voice, and be easily heard by everyone in the room. I am less tired at the end of the day, and I do not have my usual hoarse, gravelly voice.”

—Walter Timpe,
Band Director,
Bellevue School District,
Bellevue, WA.

Introduction

Carol Flexer has lectured internationally and authored more than 100 publications. She has written and coedited several books including: *How the Student with Hearing Loss Can Succeed in College*, *Sound-Field FM Amplification: Theory and Practical Applications* and *Facilitating Hearing and Listening in Young Children*. She is a past president of the Educational Audiology Association, a past Board member of Auditory-Verbal International, and a past president of the American Academy of Audiology.

Q: You have been writing and speaking about classroom audio for the better part of two decades, what is classroom audio and why are you so passionate about it?

A: Classroom audio is pretty simple. A teacher wears a mic and his/her voice is transmitted to a receiver that amplifies and evenly distributes the voice throughout the room via loudspeakers, allowing all students to clearly hear spoken instruction. The purpose of the sound system is to improve the overall intelligibility of the teacher's speech by improving the signal-to-noise ratio, especially in the higher frequencies.

Q: How does higher frequency sound affect intelligibility?

A: In order for learning to occur, children have to be able to hear all of the spoken instruction. The loudest sounds in speech are low frequency vowel sounds and they are easy to hear. On the other hand, 90% of the intelligibility of speech is in the higher frequencies. These soft consonant sounds are difficult, if not impossible, to project loudly. In order to deliver intelligible speech, we need to boost the softer sounds and slightly reduce the energy in low frequency sounds.

Q: What's the problem with today's classrooms?

A: The classroom is an auditory-verbal environment. There are several issues with today's classrooms that can hinder a child's ability to hear spoken instruction.

- Often there are more children in the room
- Multiple activities, sub groups and teams
- Different teaching styles and student seating configurations
- More Information is to be delivered—faster and at younger student ages
- Many students do not speak English at home
- More computers and instructional delivery equipment adds noise

For learning to take place, children need a quieter setting and a louder signal than adults require. Classroom audio technology helps overcome the noise and creates a better learning environment.

Q: What can you tell me about the research on classroom audio?

A: Sixty plus studies have been conducted over the past 20 years. Although classroom audio research has had various study targets such as reading, teacher vocal abuse, time on task, transition time, behavior compliance, etc., every study has shown an advantage in whatever domain they were evaluating. Classroom audio technology in every instance has been shown to deliver positive results.

Q: What about kids hearing kids?

A: Every class, in my opinion, ought to have two microphones; one for the primary teacher and a second mic for team teaching or student use. Children need to hear their own voices for many reasons; for acoustic self monitoring, to create their auditory feedback loop so they can correct their verbal productions, and when they read out loud to enhance their reading fluency, a key component of literacy development. Not only do pupils need to hear teachers, they need to hear other pupils and they need to hear themselves, and that takes two microphones.

Q: What's the connection between classroom audio and literacy?

A: A primary component of literacy is phonemic awareness—the knowledge of the sound structure of language focusing on auditory distinctions. So the clearer those auditory distinctions are to the child, the better will be their opportunity to learn to read. Studies show that literacy has been positively impacted in the classrooms that use audio systems.

Q: Can classroom audio help schools achieve the No Child Left Behind mandates and AYP goals?

A: I'll quote a friend of mine, Dr. Mark Ross, "Hearing is the primary channel for learning. The more children hear, the better they learn." I'm sure there are several valid approaches designed to raise academic achievement. What classroom audio offers is proven results without changing curricula or teaching methodology.

Q: Are there basic student rights that should be considered regarding acoustic access?

A: Every child should be able to hear the entirety of spoken instruction. Having access to clear instruction is not an extra, it's not above and beyond, but rather it's the basic foundation for education and is therefore a reasonable and appropriate expectation. Sound systems provide the minimum necessary acoustic access that should be in every classroom.

Fast Fact:

Classroom audio systems can be as simple as a plug and play unit, ideal for existing classrooms, to installed systems utilizing a receiver/ amplifier, infrared sensor and multiple speakers, typical in new construction and modernization projects.

Q: What's the number one positive (and negative) regarding classroom audio technology?

A: The biggest positive that leads to all other positive outcomes is that by improving the signal-to-noise ratio, sound systems promote an auditory focus. A key issue for children is their focus. What a sound system does, by improving the signal to noise ratio, is create an auditory focus which is critical to learning. The negative aspect of sound-field occurs only when the system is not used properly. If it's too loud it produces feedback, if the mic is worn incorrectly the voice will not be picked up. It's like driving a Corvette; it's a great machine and it will get you from zero to sixty in style, but only if you know how to shift out of first gear.

Q: If classroom audio offers so many great benefits, backed by research, why isn't it in every classroom?

A: I think it's overlooked because it seems too simple. Sometimes the simplest concepts are the most powerful. People have trouble believing how powerful an improved signal-to-noise ratio and auditory focus is for literacy and learning. When most people think of hearing they think of hearing loss, they don't realize that typical children have substantial hearing limitations as well. Acoustics for many school boards and planners is not on their radar screen. Hearing is invisible. The process of listening is invisible. It's the adults who determine appropriate listening environments, and since adults have developed compensation skills to deal with poor acoustic environments, noise issues often are overlooked.

Dr. Carol Flexer, audiologist and distinguished professor emeritus, is based at the University of Akron and Northeast Ohio Au.D. Consortium (NOAC) Akron, OH, USA. Dr. Flexer may be reached through her web site: www.carolflexer.com

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Local Lightspeed Classroom Audio Consultants are available to tour your school and help determine what systems are appropriate for optimizing the learning environment. Lightspeed representatives are also available to speak at parent teacher meetings, school board meetings or other venues where information about this simple, yet powerful technology is requested.

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Questions?

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Established in 1990, Lightspeed Technologies is the trusted provider in classroom audio technology. Our passion is to improve the listening and learning environment for every child. We believe strengthening the connection between teachers and students is at the heart of learning.

LIGHTSPEED TECHNOLOGIES

11509 SW HERMAN ROAD / TUALATIN, OREGON 97062
TOLL FREE: 800.732.8999 / PHONE: 503.684.5538 / FAX: 503.684.3197
LIGHTSPEED-TEK.COM