

M.I.N.D. Institute uses UCI research to show correlation of music and brain function

By PEGGY GOETZ IRVINE WORLD NEWS

The “Spatial Temporal Math+Music” program now being offered by the M.I.N.D. Institute in Costa Mesa is an example of basic scientific research, mostly done at UC Irvine, having been developed into a practical application now being used in schools.

The late Gordon Shaw, a professor of physics and researcher at UCI, did basic research along with his colleagues on music and the brain. Now more than 13,000 kids at schools around the state, including Tarbut V’Torah in Irvine, are using a program developed by Shaw and his colleagues to learn complex thinking and math skills.

Using the program kids do a series of specifically sequenced and structured educational computer games presenting problems that require them to form mental pictures and think ahead as well as apply the skills to math.

At the same time the kids get musical keyboard training that goes along with the program. There is also a classroom component used by teachers.

Shaw was one of the co-discoverers of the “[Mozart effect](#),” which showed that listening to a piano sonata by the composer enhanced spatial-temporal performance of college students.

Spatial-temporal skills require a person to form mental images in the absence of the objects and to think ahead. He presented the work in 1993 and continued to study the relationship between music and the brain after he became a professor emeritus at the campus in 1994. His work on music and the brain grew out of his work in the 1970s where he and William Little of Stanford developed the trion brain model of mathematics. (Information on this work is available at www.mindinstitute.net.)

When he found that basic neuron-firing in the brain used a “language” similar to acoustical frequencies in music, he recognized that in a basic way music is a window to a higher brain function, according to his colleague Mark Bodner.

In 1998 Shaw and colleagues established the non-profit M.I.N.D.

Institute. His vision was to teach all kids, regardless of background, how to think, reason and create mathematically. He ran the program from his UCI office at first.

The organization brought the program to schools, the majority of students being disadvantaged kids. Students using the program outperformed students that did not on math standards tests, according to the institute's research. One of the things that particularly pleased Shaw was the broad range of success of the students. The same program that seemed to help disadvantaged kids bring up math scores also helped high performing students improve, like those at Tarbut V'Torah.

Students love the program, said Jean Oleson who coordinates curriculum for the Jewish school. The school introduced it four years ago for second grade and two years ago for third grade. This coming year the program will be added to first and fourth grades as well.

"What struck me about the program was the integration of math understanding, keyboarding, the technology and the teacher," said Oleson. "A key piece is that math concepts are taught in a three-dimensional way, things that are usually taught in a two-dimensional way with pencil and paper," she said. "You can see the kids learning long-range thinking, planning ahead, too."

The programs are appealingly designed so most kids are eager to participate, she added. They do not have to sit and listen to [Mozart](#).

Math+Music rounds out the school's math curriculum, which consists of eight strands, like measurement, numerology and geometry. The music-math program especially enhances the geometry and measurement strands. Measurement strand includes fractions and proportions, said Oleson.

Oleson said she got a personal taste of how the instruction works when she went to the M.I.N.D. Institute offices for a demonstration. Although she has a math background, she said she has never been good at directions.

"Spatial relations are not my strong point," she laughed.

After about 10 minutes of doing a computer activity that involved "lines of symmetry," she came out to the parking lot with a whole new mindset on how to find her way back to the street. "I just thought of it in a whole new way," she said.

Andrew Coulson, the CEO, said the M.I.N.D. Institute went into its growth phase in the spring of 2004. The offices are now housed on Harbor Boulevard in Costa Mesa. There are 30 employees, about

half of them in research and design, and the rest in staff that helps with training and support at the schools, sales and administration. The company is still a non-profit organization but is now moving to be able to support the growth and development of the company, said Coulson. Shaw remained active with the company until the end of 2004, when he was diagnosed with cancer. He died this past spring.

Coulson said Shaw was able to bring together a team of researchers as well as philanthropists who all shared his vision of the potential applications of music for high learning functions. Research evidence shows promising possibilities in areas of Alzheimer's and epilepsy therapy, according to the institute's Web site.

He said Shaw's vision remains in place: To bring the ability to think, reason and create to children regardless of their socioeconomic or cultural background. Every child, he believed, has the ability to do complex mathematics and should be given the opportunity to reach their full potential.

M.I.N.D. INSTITUTE BOARD MEMBER and Irvine resident David Horowitz looks over the shoulder of a child at one of the schools using the institute's new approach to learning math and other higher reasoning skills.

GORDON SHAW, co-discoverer of the "[Mozart effect](#)" and founder of the M.I.N.D. Institute that distributes a program which mixes music and math.

Further information about the M.I.N.D. Institute and its programs is available online at www.mindinstitute.net or by calling (714) 751-5443.