

# Music for Architects

**Andy Hunter** explores the manifold benefits of the Arts in Education, highlighting a number of recent studies in neuroscience.

A three year study, *Learning, Arts, and the Brain*, published by the Dana Foundation\* in 2008, compiled the results of seven different research studies on the effects of arts education on cognitive development. Their findings were striking, discovering correlations between studying visual arts and increased attention, music training and reading ability, acting and memory improvement, and dance and observational skills. It's an unexpected series of connections which implies that, rather than separate sets of skills that rely on discrete areas in the brain, our brains are essentially interconnected in such a way that effective training in the arts carries over into many other cognitive areas.

As schools are judged on their student's test scores, arts education is often seen as an indulgence. As a result, arts programs are among the first to get cut when school budgets reach the chopping block.

But as the Dana Foundation's research shows, cutting arts education isn't just a quick fix for cash strapped schools: it has far-reaching implications for children's cognitive development. Practical educators concerned with effective learning techniques have many reasons to embrace the arts. Proponents of art education also argue it does more than just help children's memory-recall or reading skills. It adds to an overall appreciation and enjoyment of life, self-expression, and cognitive openness that will benefit a person throughout his or her life. As the summary of the Dana report states, "A life-affirming dimension is opening up in neuroscience," and recognizing the benefits of arts training will be "a long step forward in learning how better to learn and more enjoyably and productively to live."

The studies suggest that visual arts, theatre, and music class are vital components of education. While increasing a child's enjoyment of life, training in the arts also changes the brain. Improvements in the performance of arts-instructed children were both structural – strengthening

pathways in the brain – and strategic: actors' skills include learning memory techniques. Enhancements in children's performance were discovered in some surprising areas. For instance, children enrolled in six weeks of music class showed a significant improvement in various reading and math skills.

Some benefits of arts training are more intuitive. For example, what do students learn in dance class? To dance – and how does one learn to dance? By first observing, and then doing. Mirror-neurons in the brain allow people to learn how to perform an action through watching others. This is one of the most fundamental mechanisms of human learning.

Although training in each area of the arts displays unique benefits, the most dramatic results appear to be from intense music training (about twenty hours per week). Dr. Elizabeth Spelke at Harvard University found children with music training were better than their peers in Euclidean geometry – a skill invaluable to architects, engineers, and astrophysicists. They also found it easier to read maps. Dr. John Jonides at the University of Michigan found music students were able to use rehearsal strategies to improve memory. Finally, after a three-year study, Dr. Brian Wandell at Stanford University found music training increased reading fluency and speech skills. The more musical training a child had, the more their reading improved.

Dr. Wandell used diffusion tensor imaging to discover that diffusion in the nerve axon bundle that connects the left and right temporal lobes correlates with both phonological awareness and reading ability. Other studies have found a close relationship between hearing and learning. Scientists have found that children who have trouble processing sound may be easily distracted and inattentive "bad listeners" in school. A company called Scientific Learning trains children with learning disabilities to perceive sound more precisely by becoming more sensitive to changes in the tone, frequency, and duration. These improvements allow the children to hear speech more accurately and pay



According to a three year study at Stanford University learning music increases reading fluency and speech skills.

better attention in class. And reading has phonological roots: researchers at Rutgers University have demonstrated that good readers translate symbols into sound in a few thousandths of a second. Language-impaired students can take up to ten times as long to process a written word. Such research indicates that hearing sound more precisely can actually make reading easier. These connections between sound perception and learning seem to support the idea that music training might similarly benefit learning and reading skills.

These studies can only point to strong correlations, not causation, between learning in the arts and other academic achievements. But those correlations are powerful enough that anyone serious about education should take heed, just as anyone serious about the arts can attest to the self-knowledge, personal expression, aesthetic appreciation, and other benefits the arts bring to our lives, which are richer for it. ■

**Andy Hunter** is the Editor-in-Chief of Brain World Magazine and Publisher and Editor of the fiction bimonthly, Electric Literature. Previously he has served as editor-in-chief of various publications including The Brooklyn Review, Mean Magazine, and Lollapalooza Magazine.

This article first appeared in Brain World, a new magazine dedicated to the human brain and is reprinted with kind permission. [www.brainworldmagazine.com](http://www.brainworldmagazine.com)

\*The Dana Foundation is a private philanthropic organization located in New York City, whose mission is to support and publicize research in neuroscience, particularly as it affects health, education, and the arts. The Dana Foundation was created in 1950 by Charles A. Dana. The Dana Foundation publishes books dedicated to popularizing knowledge about the neurosciences, and Cerebrum, an online magazine.