

WHY STUDY MUSIC?

Twelve Benefits of Music Study

1. LANGUAGE SKILLS

Early musical training helps develop brain areas involved in language and reasoning. Recent studies clearly indicate that musical training physically develops the part of the left side of the brain known to be involved with processing language, and it can actually wire the brain's circuits in specific ways.

In one study, four groups of children aged six to nine years, who were experiencing reading difficulties, participated in a program involving listening to music. The study found that the children who listened to music had significant improvements in learning new words. The findings suggest that music may be an effective learning medium for aspects of language development, especially for students with reading problems.¹

2. SPATIAL-TEMPORAL REASONING

Spatial-temporal reasoning skills contribute to the ability to perceive the world accurately and to form mental pictures. These skills are critical to the sort of abstract thinking necessary for everything from solving advanced math and science problems to being able to pack a book bag with everything that will be needed for the day. Researchers found that children given music training – specifically piano instruction – had dramatic, long-term enhancement in spatial-temporal reasoning skills, as compared to children who received computer lessons, casual singing, or no music lessons.²

3. CREATIVE THINKING & PROBLEM SOLVING

Musicians learn to think creatively and solve problems by imagining various solutions. In musical study, one learns to attend to many details, as well as to the “big picture,” and to unify diverse elements into a cohesive whole. In a study on music and creativity, first-grade students who had daily music instruction scored higher on creativity tests than a control group without music instruction.³

According to the Center for Timing, Coordination, and Motor Skills, students who can perform complex rhythms can make faster and more precise corrections in many academic and physical problem-solving situations.⁴

1 Bygrave, P.L. (1995-1996). Development of receptive vocabulary skills through exposure to music. *Bulletin of the Council for Research in Music Education* no. 127, Winter, pg. 28-34

2 Shaw, Rauscher, Levine, Wright, Dennis and Newcomb, "Music training causes long-term enhancement of preschool children's spatial-temporal reasoning," *Neurological Research*, Vol. 19, February 1997 and Shaw, Grazianow, and Peterson, *Neurological Research*, March 1999.

3 K.L. Wolff, *The Effects of General Music Education on the Academic Achievement, Perceptual-Motor Development, Creative Thinking, and School Attendance of First-Grade Children*, 1992.

4 Rhythm seen as key to music's evolutionary role in human intellectual development, *Center for Timing, Coordination, and Motor Skills*, 2000.

4. ACADEMICS

Skills such as reading, anticipating, memory, listening, forecasting, recall, and concentration are developed in musical performance, and these skills are valuable to students in many academic subjects, including math, reading, and science.

A study of elementary students concluded that students' math test scores rose as their music education increased.⁵ In another study, music students out-performed non-music students on achievement tests in reading and math.⁶ Students who report consistently high levels of involvement in instrumental music throughout middle and high school years show significantly higher levels of mathematical proficiency by grade 12, regardless of socioeconomic status.⁷

Music study has also been found to correlate with learning more advanced mathematic concepts, such as ratios and fractions. Second-grade students were given four months of piano keyboard training, as well as time using newly designed math software. The group scored over 27 percent higher on proportional math and fractions tests than children who used only the math software.⁸ These findings are particularly significant in light of the fact that grasping proportional math and fractions is prerequisite to learning math at higher levels, and children who do not master these areas cannot understand more advanced math concepts, which are critical to high-tech fields.

In another study, UCLA professor of education James Catterall studied the relationship between music and overall academic achievement. Specifically, Catterall was interested in what happens to the students of lower socioeconomic status who took music lessons in grades 8-12, compared to similar students who took no music lessons. In his findings, students who took music increased their math scores significantly as compared to the non-music control group. But just as important, reading, history, geography and even social skills soared by 40 percent. Thus, music-making supports the development of not only math skills, but all skills, for students from a variety of socioeconomic levels.⁹

Music has also been shown to play a significant role in students' college admissions. Recent studies reveal a link between music study and performance on college-entrance tests such as the SAT. In one study, students in music performance scored 57 points higher on the verbal and 41 points higher on the math, and students in music appreciation scored 63 points higher on verbal and 44 points higher on the math, than did students with no music participation.¹⁰ Furthermore, College admissions officers continue to cite participation in music as an important factor in making admissions decisions, stating that music participation develops skills in time management, creativity, expression, and open-mindedness.¹¹

As the technology workforce increases, we are beginning to see a link between musical study and success in technological industries. As author Grant Venerable points out, "The very best engineers and technical designers in the Silicon Valley industry are, nearly

5 "Arts Exposure and Class Performance," Phi Delta Kappan, October, 1998.

6 B. Friedman, "An Evaluation of the Achievement in Reading and Arithmetic of Pupils in Elementary School Instrumental Music Classes," Dissertation Abstracts International.

7 James Catterall, Richard Chapleau, and John Iwanaga, "Involvement in the Arts and Human Development.

8 Source: Neurological Research March, 1999

9 (Catterall et al., 1999).

10 Source: Profile of SAT and Achievement Test Takers, The College Board, compiled by Music Educators National Conference, 2001.

11 Carl Hartman, "Arts May Improve Students' Grades," The Associated Press, October, 1999.

without exception, practicing musicians.”¹² It is also important to note that the world's top academic countries place a high value on music education. Hungary, Netherlands and Japan excel worldwide in science achievement and have strong commitments to music education. All three countries have required music training at the elementary and middle school levels, both instrumental and vocal, for several decades.¹³

5. CULTURAL UNDERSTANDING

”Music is one way for young people to connect with themselves, but it is also a bridge for connecting with others.” (Daniel A. Carp, Eastman Kodak Company Chairman and CEO). A study of the arts provides children with an internal glimpse of other cultures and teaches them to be empathetic towards the people of these cultures. This development of compassion and empathy provides a bridge across cultural chasms that lead to respect of other races at an early age.

6. CRAFTSMANSHIP

Students of the arts learn craftsmanship as they study how details are put together painstakingly and what constitutes good, as opposed to mediocre, work. These standards, when applied to a student's own work, demand a new level of excellence and require students to stretch their inner resources.

7. HARD WORK & DISCIPLINE

Through music study, students learn the value of sustained effort and the concrete rewards of hard work and discipline, traits that carry over into intellectual pursuits and lead to effective study and work habits. Learning to play a musical instrument is a great opportunity for children to learn to schedule priorities and to understand there is not always enough time in the day to do *everything*, but to choose wisely those activities that are most important. Furthermore, music students learn patience as they discover that “results” are not seen as quickly in music as they may be in other activities.

8. TEAMWORK & SOCIAL SKILLS

Music study enhances teamwork skills. Students learn that they must “do their part” by practicing faithfully, just as their parents (“practice partners”) and teacher are doing their parts to help them learn the piano. Teamwork skills are further developed as students play duets and ensembles with other pianists. Through musical collaboration, students learn to listen to one another and, together, realize that the (musical) whole is greater than the sum of its parts.

Recent research supports the positive effects of music on social behaviors. In one study, seventh and eighth grade students in Los Angeles were involved in a social studies curriculum involving music and other arts. Compared to control classes having standard curricula, students exposed to music and other arts had significant increases in positive social behaviors, including helping and sharing, increases in empathy for others, and

¹² Grant Venerable, "The Paradox of the Silicon Savior," as reported in "The Case for Sequential Music Education in the Core Curriculum of the Public Schools," The Center for the Arts in the Basic Curriculum, New York, 1989

¹³ Source: 1988 International Association for the Evaluation of Educational Achievement (IAEEA) Test

beneficial attitudes, including reduced prejudice and racism. Teachers also found that students were less aggressive.¹⁴

9. SELF-EXPRESSION

Music-making is a powerful language of expression which allows us to create, reflect, formulate, ponder, react, and bare our souls. Through music we communicate our feelings and tell stories of our experiences, and in so doing, we connect with ourselves and those around us.

10. EMOTIONAL HEALTH

College-age musicians are emotionally healthier than their non-musician counterparts. A study conducted at the University of Texas looked at 362 students who were in their first semester of college. They were given three tests, measuring performance anxiety, emotional concerns, and alcohol-related problems. In addition to having significantly fewer alcohol-related problems, college-aged music students seemed to face tests more confidently.¹⁵

11. CONFIDENCE

Music study develops skills that are necessary throughout life. It focuses on "doing," as opposed to observing, and teaches students how to perform in front of others. A McGill University study found that children who had taken three years of piano instruction had significantly higher self-esteem than children who were not enrolled in piano lessons. These results were not related to family income, sex, family structure, or parental employment.¹⁶

Benefits such as these appear in older children, as well. Recent studies show that middle school and high school students who are involved in music have better "real life" skills than students having little or no music education. Middle and high school music students are more self-confident, express their ideas better, and are more cooperative in working with other students and teachers.¹⁷

12. ENHANCES OVERALL BRAIN FUNCTION

"The musician is constantly adjusting decisions on tempo, tone, style, rhythm, phrasing, and feeling, thereby training the brain to become incredibly good at organizing and conducting numerous activities at once.¹⁸ Recent studies reveal that playing music is not a localized brain function but, rather, taps into multiple brain centers. In one study, various brain imaging techniques were used to investigate brain activity during musical tasks. Results showed that sight-reading musical scores and playing music both activate regions

¹⁴ Konrad, R.R. (2000), *Empathy, Arts and Social Studies*, Dissertation Abs.: Human. & Soc. Sci., 60, pg 2352
¹⁵ Source: Houston Chronicle, January 11, 1998

¹⁶ Costa-Giomi, E. (1999). The effects of three years of piano instruction on children's cognitive development. *Journal of Research in Music Education*. 47:3, 198-213.

¹⁷ The Impact of the Arts on Learning, MRN, Spring 2000

¹⁸ Roney John J., MD. *A User's Guide to the Brain*. New York: Pantheon Books, 2001.

in all four of the cortex lobes, and that parts of the cerebellum are also activated during those tasks.¹⁹

In a study conducted by Dr. Timo Krings, pianists and non-musicians of the same age and sex were required to perform complex sequences of finger movements. Their brains were scanned using a technique called “functional magnetic resource imaging” (fMRI), which detects the activity levels of brain cells. The non-musicians were able to make the movements as correctly as the pianists, but less activity was detected in the pianists’ brains. Thus, compared to non-musicians, the brains of pianists are more efficient at making skilled movements.²⁰

Researchers in Leipzig found that brain scans of musicians showed larger planum temporale (a brain region related to some reading skills) than those of non-musicians. They also found that the musicians had a thicker corpus callosum (bundle of nerve fibers connecting the two halves of the brain) than those of non-musicians, especially for those who had begun their training before the age of seven.

In conclusion, musical arts are not only part of our built-in biological design, but they may also develop essential neurobiological systems. Neurobiologist Mark Jude Tramo of Harvard Medical School says, “Music is biologically part of human life, just as music is aesthetically part of human life.” Compelling evidence supports the hypothesis that musical arts may provide a positive, significant, and lasting benefit to learners. There is no single piece of evidence, but the diversity and depth of supporting material is overwhelming. If this were a court case, the ruling would be that music is valuable “beyond a reasonable doubt.”

19 Sergent, J., Zuck, E., Ténier, S., and MacDonall, B. (1992). Distributed neural network underlying musical sight reading and keyboard performance. *Science*, 257, 106-109.

20 The Impact of Arts on Learning.” *MuSICa Research Notes* 7, no. 2 (Spring 2000). Reporting on Krings, Timo et al. “Cortical Activation Patterns during Complex Motor Tasks in Piano Players and Control Subjects. A Functional Magnetic Resonance Imaging Study.” *Neuroscience Letters* 278, no. 3 (2000): 189-93.