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## Music Education Facts and Figures

Need specific press information? Contact Elizabeth Lasko at MENC ([ElizabethL@menc.org](mailto:ElizabethL@menc.org)).

Need specific advocacy information? Contact Sue Rarus at MENC ([suer@menc.org](mailto:suer@menc.org)).

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**"Every student in the nation should have an education in the arts."** This is the opening of "The Value and Quality of Arts Education: A Statement of Principles," a document from the nation's most important educational organizations, including the American Association of School Administrators, the National Education Association, the National Parent Teacher Association, and the National School Boards Association.

The basic statement is unlikely to be challenged by anyone involved in education. In the somber reality of limited time and funding for instruction, however, the inclusion of the arts in every student's education can sometimes be relegated to a distant wish rather than an exciting reality.

It doesn't have to be that way! All that's needed is a clear message sent to all those who make the choices involved in running a school or school system. The basic message is that music programs help our kids and communities in real and substantial ways. You can use the following facts about music education, based on a growing body of convincing research, to move decision-makers to make better choices.

The benefits conveyed by music education can be grouped in four categories:

- Success in society
- Success in school
- Success in developing intelligence
- Success in life

When presented with the many and manifest benefits of music education, officials at all levels universally support a full, balanced, sequential course of music instruction taught by qualified teachers. Every student will have an education in the arts.

### **Benefit One: Success in Society**

Perhaps the basic reason that every child must have an education in music is that music is a part of our society. The intrinsic value of music for each individual is widely recognized in the many corners of American life — indeed, every human culture uses music to carry forward its ideas and ideals. The value of music to our economy is without doubt. And the value of music in shaping individual abilities is attested in a number of places:

- Secondary students who participated in band or orchestra reported the lowest lifetime use of alcohol and tobacco, and illicit drugs. — *Texas Commission on Drug and Alcohol Abuse, Reported in Houston Chronicle, January 1998*

- "Music is a magical gift we must nourish and cultivate in our children, especially now as science proves that an education in the arts makes better math and science students, enhances speech in newborns, and let's not forget that the arts are a compelling solution to teen violence, because of it!"— *Michael Greene, Recording Academy President and CEO at the 42nd Annual Grammy Awards, February 2000.*
- The U.S. Department of Education lists the arts as subjects that college-bound middle and high school students should take, stating "Many colleges view participation in the arts and music experience that broadens students' understanding and appreciation of the world around them. It is well known and widely recognized that the arts contribute significantly to children's intellectual development. In addition, one year of Visual and Performing Arts is recommended for college-bound high school students." — *Getting Ready for College Early: A Handbook for Parents of Students in the Middle and Junior High Years, U.S. Department of Education, 1997*
- The College Board identifies the arts as one of the six basic academic subject areas students need to succeed in college. — *Academic Preparation for College: What Students Need to Know to Do, 1983 [still in use], The College Board, New York*
- The arts create jobs, increase the local tax base, boost tourism, spur growth in related businesses (e.g., restaurants, printing, etc.) and improve the overall quality of life for our cities and towns. At the national level, nonprofit arts institutions and organizations generate an estimated \$37 billion in economic activity and return \$3.4 billion in federal income taxes to the U.S. Treasury each year. — *American Fact Sheet, October 1996*
- The very best engineers and technical designers in the Silicon Valley industry are, nearly without exception, practicing musicians. — *Grant Venerable, "The Paradox of the Silicon Savior," as reported in Sequential Music Education in the Core Curriculum of the Public Schools," The Center for the Study of the Basic Curriculum, New York, 1989*

### **Benefit Two: Success in School**

Success in society, of course, is predicated on success in school. Any music teacher or parent can call to mind anecdotes about effectiveness of music study in helping children become better students. Skills learned through the discipline of music, these stories commonly point out, transfer to study skills, communication skills, and cognitive skills useful in every part of the curriculum. Another common theme emphasizes the way that the discipline of music study — particularly through participation in ensemble — helps students learn to work effectively in the school environment without resorting to violent or inappropriate behavior. And there are a number of hard facts that we can report about the ways that music study is correlated with success in school:

- "The term 'core academic subjects' means English, reading or language arts, mathematics, science, social studies, languages, civics and government, economics, arts, history, and geography." — *No Child Left Behind Act of 2002, Title IX, Part A, Sec. 9101 (11)*
- A study of 237 second grade children used piano keyboard training and newly designed math software to demonstrate improvement in math skills. The group scored 27% higher on proportional math tests than children that used only the math software. — *Graziano, Amy, Matthew Peterson, Shaw, "Enhanced learning of proportional math through music training and spatial-temporal processing," Neurological Research 21 (March 1999).*
- In an analysis of U.S. Department of Education data on more than 25,000 secondary school students (NELS:88, National Education Longitudinal Survey), researchers found that students who reported high levels of involvement in instrumental music over the middle and high school years showed higher levels of mathematics proficiency by grade 12." This observation holds regardless of economic status, and differences in those who are involved with instrumental music vs. those who are not are more significant over time. — *Catterall, James S., Richard Chappleau, and John Iwanaga. "Involvement in the Arts and Human Development: General Involvement and Intensive Involvement in Music." Los Angeles, CA: The Imagination Project at UCLA Graduate School of Education and Information Studies, 1999.*
- Students with coursework/experience in music performance and music appreciation scored higher on SAT: students in music performance scored 57 points higher on the verbal and 41 points higher on math, and students in music appreciation scored 63 points higher on verbal and 44 points higher on math.

math, than did students with no arts participation. — *College-Bound Seniors National Report Program Test Takers*. Princeton, NJ: The College Entrance Examination Board, 2001.

- According to statistics compiled by the National Data Resource Center, students who can be “disruptive” (based on factors such as frequent skipping of classes, times in trouble, in-school disciplinary reasons given, arrests, and drop-outs) total 12.14 percent of the total school population. In contrast, only 8.08 percent of students involved in music classes meet the same criteria as those who are disruptive. — *Based on data from the NELS:88 (National Education Longitudinal Study), second follow-up*
- Data from the National Education Longitudinal Study of 1988 showed that music participants earned more academic honors and awards than non-music students, and that the percentage of music participants receiving As, As/Bs, and Bs was higher than the percentage of non-music participants receiving the same grades. — *NELS:88 First Follow-up, 1990, National Center for Education Statistics, Washington DC*
- Physician and biologist Lewis Thomas studied the undergraduate majors of medical school applicants and found that 66% of music majors who applied to medical school were admitted, the highest percentage of any group. 44% of biochemistry majors were admitted. — *As reported in "The Case for Music in Schools," Phi Delta Kappan, February 1994*
- A study of 811 high school students indicated that the proportion of minority students with music teachers as their role models was significantly larger than for any other discipline. 36% of these students identified music teachers as their role models, as opposed to 28% English teachers, 11% elementary teachers, 10% education/sports teachers, 1% principals. — *D.L. Hamann and L.M. Walker, "Music teachers as role models for African-American students," Journal of Research in Music Education, 41, 1993*
- Students who participated in arts programs in selected elementary and middle schools in New York City showed significant increases in self-esteem and thinking skills. — *National Arts Education Report, New York University, 1990*

### **Benefit three: Success in Developing Intelligence**

Success in school and in society depends on an array of abilities. Without joining the intense debate about the nature of intelligence as a basic ability, we can demonstrate that some measures of a child's intelligence are indeed increased with music instruction. Once again, this burgeoning range of data adds to the long-established base of anecdotal knowledge to the effect that music education makes kids smarter. And especially compelling, however, is a combination of tightly-controlled behavioral studies and neurological research that show how music study can actively contribute to brain development:

- In a study conducted by Dr. Timo Krings, pianists and non-musicians of the same age and ability were required to perform complex sequences of finger movements. Their brains were scanned using a technique called “functional magnetic resonance imaging” (fMRI) which detects the activity levels of brain regions. Non-musicians were able to make the movements as correctly as the pianists, but less actively. — *Norm. "The Impact of Arts on Learning." MuSICa Research Notes 7, no. 2 (Spring 2000). R. Krings, Timo et al. "Cortical Activation Patterns during Complex Motor Tasks in Piano Player Subjects. A Functional Magnetic Resonance Imaging Study." Neuroscience Letters 278, no. 1, 1999, pp. 93-96.*
- “The musician is constantly adjusting decisions on tempo, tone, style, rhythm, phrasing, and dynamics, training the brain to become incredibly good at organizing and conducting numerous activities. Dedicated practice of this orchestration can have a great payoff for lifelong attentional skills and an ability for self-knowledge and expression.” — *Ratey John J., MD. A User's Guide to the Brain. New York: Pantheon Books, 2001.*
- A research team exploring the link between music and intelligence reported that music training was superior to computer instruction in dramatically enhancing children's abstract reasoning skills, a skill necessary for learning math and science. — *Shaw, Rauscher, Levine, Wright, Dennis and N. "Music training causes long-term enhancement of preschool children's spatial-temporal reasoning, Research, Vol. 19, February 1997*
- Students in two Rhode Island elementary schools who were given an enriched, sequential, music program showed marked improvement in reading and math skills. Students in the experimental group who had started out behind the control group caught up to statistical equality in reading, ar

- in math. — *Gardiner, Fox, Jeffrey and Knowles, as reported in Nature, May 23, 1996*
- Researchers at the University of Montreal used various brain imaging techniques to investigate during musical tasks and found that sight-reading musical scores and playing music both activate all four of the cortex's lobes; and that parts of the cerebellum are also activated during the task. — *Sergent, J., Zuck, E., Terhaim, S., and MacDonall, B. (1992). Distributed neural network underlying sight reading and keyboard performance. Science, 257, 106-109.*
  - Researchers in Leipzig found that brain scans of musicians showed larger planum temporale (an area related to some reading skills) than those of non-musicians. They also found that the music players had a thicker corpus callosum (the bundle of nerve fibers that connects the two halves of the brain) than non-musicians, especially for those who had begun their training before the age of seven. — *Jancke, L., Huang, Y., and Steinmetz, H. (1994). In vivo morphometry of interhemispheric connectivity in musicians. In I. Deliège (Ed.), Proceedings of the 3d international conference on perception and cognition (pp. 417-418). Liege, Belgium.*
  - A University of California (Irvine) study showed that after eight months of keyboard lessons, children showed a 46% boost in their spatial reasoning IQ. — *Rauscher, Shaw, Levine, Ky and Wright. "Spatial Task Performance: A Causal Relationship," University of California, Irvine, 1994*
  - Researchers found that children given piano lessons significantly improved in their spatial-temporal scores (important for some types of mathematical reasoning) compared to children who received no lessons, casual singing, or no lessons. — *Rauscher, F.H., Shaw, G.L., Levine, L.J., Wright, L.W.R., and Newcomb, R. (1997) Music training causes long-term enhancement of preschool temporal reasoning. Neurological Research, 19, 1-8.*
  - A McGill University study found that pattern recognition and mental representation scores improved significantly for students given piano instruction over a three-year period. They also found that musical skills measures improved for the students given piano instruction. — *Costa-Giomi, A. (April). The McGill Piano Project: Effects of three years of piano instruction on children's cognitive, academic achievement, and self-esteem. Paper presented at the meeting of the Music Education Conference, Phoenix, AZ.*
  - Researchers found that lessons on songbells (a standard classroom instrument) led to significant improvement of spatial-temporal scores for three- and four-year-olds. — *Gromko, J.E., and Gromko, J.E. (1998) The effect of music training on preschooler's spatial-temporal task performance. Journal of Music Education, 46, 173-181.*
  - In the Kindergarten classes of the school district of Kettle Moraine, Wisconsin, children who received music instruction scored 48 percent higher on spatial-temporal skill tests than those who did not receive music training. — *Rauscher, F.H., and Zupan, M.A. (1999). Classroom keyboard instruction and kindergarten children's spatial-temporal performance: A field study. Manuscript in press, Educational Research Quarterly.*
  - An Auburn University study found significant increases in overall self-concept of at-risk children in an arts program that included music, movement, dramatics and art, as measured by the Children's Self-Concept Scale. — *N.H. Barry, Project ARISE: Meeting the needs of disadvantaged children through the arts, Auburn University, 1992*

#### **Benefit four: Success in Life**

Each of us wants our children — and the children of all those around us — to achieve success in employment, and success in the social structures through which we move. But we also want our children to experience "success" on a broader scale. Participation in music, often as not based on formal music education during the formative school years, brings countless benefits to each individual child. The benefits may be psychological or spiritual, and they may be physical as well:

- "Studying music encourages self-discipline and diligence, traits that carry over into intellectual pursuits that lead to effective study and work habits. An association of music and math has, in fact, been found. Creating and performing music promotes self-expression and provides self-gratification which is a pleasure to others. In medicine, increasing published reports demonstrate that music has a positive effect on patients. For all these reasons, it deserves strong support in our educational system, along with the arts, the sciences, and athletics." — *Michael E. DeBakey, M.D., Leading Heart Surgeon, Baylor University Medical Center*

- "Music has a great power for bringing people together. With so many forces in this world acwedges between people, it's important to preserve those things that help us experience our humanity." — *Ted Turner, Turner Broadcasting System.*
- "Music is one way for young people to connect with themselves, but it is also a bridge for ctothers. Through music, we can introduce children to the richness and diversity of the huma the myriad rhythms of life." — *Daniel A. Carp, Eastman Kodak Company Chairman and CEO*
- "Casals says music fills him with the wonder of life and the 'incredible marvel' of being a hu it expands his mind and challenges him to be a true individual. Bernstein says it is enrichin To me, that sounds like a good cause for making music and the arts an integral part of eve education. Studying music and the arts elevates children's education, expands students' ho teaches them to appreciate the wonder of life." — *U.S. Secretary of Education Richard W. F*
- "The nation's top business executives agree that arts education programs can help repair w American education and better prepare workers for the 21<sup>st</sup> century."— "*The Changing Wo Changing Our View of Education.*" *Business Week, October 1996.*
- "Music making makes the elderly healthier.... There were significant decreases in anxiety, c loneliness following keyboard lessons. These are factors that are critical in coping with stres the immune system, and in improved health. Results also show significant increases in hur hormones following the same group keyboard lessons. (Human growth hormone is implicat pains.)" — *Dr. Frederick Tims, reported in AMC Music News, June 2, 1999*
- "Music education opens doors that help children pass from school into the world around the work, culture, intellectual activity, and human involvement. The future of our nation depen our children with a complete education that includes music." — *Gerald Ford, former Preside of America*
- "During the Gulf War, the few opportunities I had for relaxation I always listened to music, me great peace of mind. I have shared my love of music with people throughout this world to the drums and special instruments of the Far East, Middle East, Africa, the Caribbean, ar — and all of this started with the music appreciation course that I was taught in a third-gra class in Princeton, New Jersey. What a tragedy it would be if we lived in a world where mus taught to children." — *H. Norman Schwarzkopf, General, U.S. Army, retired*
- "Music is about communication, creativity, and cooperation, and, by studying music in scho have the opportunity to build on these skills, enrich their lives, and experience the world fr perspective." — *Bill Clinton, former President, United States of America*

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