



How Music Education
Helps Students Learn,
Achieve, and Succeed

Music Matters



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Beyond the intrinsic value of music to cultures worldwide, education in music has benefits for young people that transcend the musical domain. The Arts Education Partnership (AEP) reviewed an extensive body of research to identify high-quality, evidence-based studies that document student learning outcomes associated with an education in and through music. The results show conclusively that music education equips students with the foundational abilities to learn, to achieve in other core academic subjects, and to develop the capacities, skills and knowledge essential for lifelong success.

Music produces a kind of pleasure which human nature cannot do without.

~ Confucius

Benefits of Music Education

- A** Music education prepares students to learn
 1. Enhances fine motor skills
 2. Prepares the brain for achievement
 3. Fosters superior working memory
 4. Cultivates better thinking skills

- B** Music education facilitates student academic achievement
 1. Improves recall and retention of verbal information
 2. Advances math achievement
 3. Boosts reading and English language arts (ELA) skills
 4. Improves average SAT scores

- C** Music education develops the creative capacities for lifelong success
 1. Sharpens student attentiveness
 2. Strengthens perseverance
 3. Equips students to be creative
 4. Supports better study habits and self-esteem

Music education prepares students to learn.

Music education readies students for learning by helping to develop their basic mental skills and capacities. Music instruction impacts learning in the following ways:

- 1 Enhances fine motor skills.** Motor function is the ability to use small, acute muscle movements to write, use a computer, and perform other physical activities essential for classroom learning. The parts of the brain associated with sensory and motor function are developed through music instruction, and musically trained children have better motor function than non-musically trained children (Forgeard, 2008; Hyde, 2009; Schlaug et al., 2005).
- 2 Prepares the brain for achievement.** Complex math processes are more accessible to students who have studied music because the same parts of the brain used in processing math are strengthened through practice in music. For example, students who take music in middle school score significantly higher on algebra assessments in ninth grade than their non-music counterparts, as their brains are already accustomed to performing the processes used in complex math (Helmrich, 2010).
- 3 Fosters superior working memory.** Working memory is the ability to mentally hold, control and manipulate information in order to complete higher-order tasks, such as reasoning and problem solving. Musicians are found to have superior working memory compared to non-musicians. Musicians are better able to sustain mental control during memory and recall tasks, most likely as a result of their long-term musical training (Berti et al., 2006; Pallesen et al., 2010).
- 4 Cultivates better thinking skills.** Thinking skills such as abstract reasoning are integral to students' ability to apply knowledge and visualize solutions. Studies have shown that young children who take keyboard lessons have greater abstract reasoning abilities than their peers, and these abilities improve over time with sustained training in music (Rauscher, 2000).



Music education facilitates student academic achievement.

Not only do students who study music develop musical abilities, they receive benefits that extend to other academic areas, leading to overall scholastic success. Music education benefits student achievement in the following ways:

- 1 Improves recall and retention of verbal information.** Musical training develops the region of the brain responsible for verbal memory—the recall and retention of spoken words—which serves as a foundation for retaining information in all academic subjects. Music students who were tested for verbal memory showed a superior recall for words as compared to non-music students (Ho et al., 1998; 2003).
- 2 Advances math achievement.** Students who study music outperform their non-music peers in assessments of math, and the advantage that music provides increases over time. These findings hold true regardless of socio-economic status and race/ethnicity (Baker, 2011; Catterall, 1998). Additionally, students involved in instrumental music do better in algebra, a gateway for later achievement (Helmrich, 2010; U.S. National Mathematics Advisory Panel, 2008).
- 3 Boosts reading and English language arts (ELA) skills.** Students who study music surpass non-music students in assessments of writing, using information resources, reading and responding, and proofreading. The gains in achievement of music students compared to non-music students increase over time (Baker, 2011; Catterall, 1998).
- 4 Increases average SAT scores.** The SAT is a standardized test designed to measure “readiness for college.” An analysis of 10 years of SAT data revealed that students who took four years of arts courses in high school earned the highest scores on both the verbal and math SAT, but overall, students taking any arts courses scored significantly higher than students who took no arts courses (Vaughn et al., 2000). Of these students, those who took music courses earned the highest math and second highest verbal SAT scores (College Board, 2010).



Music education develops the creative capacities for lifelong success.

Engagement, persistence, and creativity are components of higher-level thinking and complex problem solving (Costa & Kallick, 2000). Music education nurtures these habits of mind that are essential for success in today's global, knowledge-based economy in the following ways:

- 1 Sharpens student attentiveness.** The ability to pay attention—visual focus, active listening and staying on task—is essential to school performance. It begins to develop early in life and is continuously refined. Early childhood training in instrumental music improves these attention abilities, while continued music education throughout adolescence reinforces and strengthens them (Neville et al., 2008). Attentiveness is an essential building block of engagement, a competency necessary for success in school and the workforce.
- 2 Strengthens perseverance.** Perseverance is the ability to continue towards a goal when presented with obstacles. It is developed and strengthened through music education. Students involved in music lessons surpass their peers on tasks measuring perseverance. At the foundation of perseverance are motivation, commitment and persistence, all traits of creative individuals (Scott, 1992).
- 3 Equips students to be creative.** Employers identify creativity as one of the top five skills important for success in the workforce (Lichtenberg, Woock, & Wright, 2008). Music education helps develop originality and flexibility, which are key components of creativity and innovation. Graduates from music programs report that creativity, teamwork, communication, and critical thinking are skills and competencies necessary in their work, regardless of whether they are working in music or in other fields (Craft, 2001; SNAAP, 2011).
- 4 Supports better study habits and self-esteem.** A study of music majors found that they felt more prepared for success in college than non-music majors. This readiness may be due to the music majors' discipline and focus developed via intense practice and performance routines prior to college. These habits are typical of music students and may generalize to other academic areas and social/emotional aspects of life, contributing to higher self-esteem and success (Chesky et al., 1997).



Taken together, the studies in these three areas not only fortify one another but provide evidence of a *continuum of success*. Early and sustained educational experiences in music deliver multiple, reinforcing, and cumulative impacts that help prepare young people to learn, achieve, and succeed.

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One Massachusetts Ave., NW
Suite 700
Washington, DC 20001
aep-arts.org

About the Arts Education Partnership



The Arts Education Partnership is dedicated to securing a high quality arts education for every young person in America. A national coalition of more than 100 education, arts, cultural, government, business and philanthropic organizations, AEP was created in 1995 by the National Endowment for the Arts and the U.S. Department of Education and is administered by the Council of Chief State School Officers and the National Assembly of State Arts Agencies.

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Citations

- Baker R. A. (2011). The Relationship between Music and Visual Arts Formal Study and Academic Achievement on the Eighth-Grade Louisiana Educational Assessment Program (LEAP) Test. (Doctoral dissertation, Louisiana State University, 2011).
- Berti, S., et al. (2006). Different Interference Effects in Musicians and a Control Group. *Experimental Psychology*, 53(2), 111-116.
- Catterall, J. S., et al. (1998). Involvement in the Arts and Human Development: General Involvement and Intensive Involvement in Music and Theatre Arts. In E. B. Fiske (Ed.), *Champions of Change* (pp. 1-18). Washington, DC: the Arts Education Partnership & the President's Committee on the Arts and the Humanities.
- Chesky, K. S., & Hipple, J. (1997, December). Performance Anxiety, Alcohol-related Problems, and Social/Emotional Difficulties of College Students: A Comparative Study Between Lower-division Music and Non-music Majors. *Medical Problems of Performing Artists*, 126-132.
- College Board. (2010). 2010 College-bound Seniors Total Group Profile Report. New York.
- Costa, A. L., & Kallick, B. (2000). Describing the 16 Habits of Mind. Adapted from A. L. Costa & B. Kallick, *Habits of Mind: A Developmental Series*. Alexandria, VA: Association for Supervision and Curriculum Development (ASCD).
- Craft, A. (2001). An Analysis of Research and Literature on Creativity and Education. Report Prepared for the Qualifications and Curriculum Authority. Coventry, England.
- Forgeard, M., et al. (2008). Practicing a Musical Instrument in Childhood is Associated with Enhanced Verbal Ability and Nonverbal Reasoning. *PLoS ONE* 3(10): e3566.
- Gouzouasis, P., et al. (2007). The Predictive Relationship Between Achievement and Participation in Music and Achievement in Core Grade 12 Academic Subjects. *Journal of Research in Music Education*, 9(1), 81-92.
- Helmrich, B. H. (2010). Window of Opportunity? Adolescence, Music, and Algebra. *Journal of Adolescent Research*, 25(4), 557-577.
- Ho, Y., et al. (1998, November 12). Music Training Improves Verbal Memory. *Nature*, 396, p 128.
- Ho, Y., et al. (2003). Music Training Improves Verbal but Not Visual Memory: Cross-sectional and Longitudinal Explorations in Children. *Neuropsychology*, 17(3), 439-450.
- Hyde, K. L., et al. (2009). Musical Training Shapes Structural Brain Development. *The Journal of Neuroscience*, 29(10), 3019-3025.
- Lichtenberg, J., et al. (2008). *Ready to Innovate: Are Educators and Executives Aligned on the Creative Readiness of the U.S. Workforce?* New York, NY: The Conference Board.
- Neville, H., et al. (2008). Effects of Music Training on Brain and Cognitive Development in Under-privileged 3- to 5-year-old Children: Preliminary Results. In C. Asbury & B. Rich (Eds.), *Learning, Arts, and the Brain: The Dana Consortium Report on Arts and Cognition* (pp. 105-116). New York, NY: Dana Press.
- Pallesen, K. J., et al. (2010). Cognitive Control in Auditory Working Memory Is Enhanced in Musicians. *PLoS ONE* 5(6): e11120.
- Rauscher, F. H., & Zupan M. A. (2000). Classroom Keyboard Instruction Improves Kindergarten Children's Spatial-Temporal Performance: A Field Experiment. *Early Childhood Research Quarterly* 15(2), 215-228.
- Schlaug, G., et al. (2005). Effects of Music Training on Children's Brain and Cognitive Development. In S.D. Lipscomb, et al (Eds.), *Proceedings of the 8th International Conference on Music Perception & Cognition* (pp. 133-134). Adelaide, Australia: Causal Productions.
- Scott, L. (1992). Attention and Perseverance Behaviors of Preschool Children Enrolled in Suzuki Violin Lessons and Other Activities. *Journal of Research in Music Education*, 40(3), 225-235.
- Strategic National Arts Alumni Project (SNAAP). (2010). *Forks in the Road: The Many Paths of Arts Alumni: Strategic National Arts Alumni Project 2010 Findings*. Bloomington, IN.
- U.S. Department of Education. (2008). *Foundations for Success: The Final Report of the National Mathematics Advisory Panel*. Washington, DC.
- Vaugh, K., & Winner, E. (2000). SAT Scores of Students Who Study the Arts: What We Can and Cannot Conclude about the Association. *Journal of Aesthetic Education* 34(3/4), 77-98.
- Wetter, O. E., et al. (2009). Does Musical Training Improve School Performance? *Instructional Science*, 37, 365-374.