http://www.handbellmusicians.org/resources/ResourcePDFs/AcademicAchievement.pdf

Music’s Effect on Academic Achievement By Joyce Kelstrom

The information about handbells and handchimes is highlighted in red on pages 2, 3 & 4.

The importance of music in our schools is often overlooked and its true power unrealized. Music deserves a place with the core subjects of math, science, history, and language arts. If it is given the opportunity, music can make a difference in the academic achievement of our students. The teaching of handbells and chimes can be an integral part of the music curriculum, which in turn can influence our students' achievement in academics.

 The essence of the question of how or if music relates to students' success in the other disciplines is crucial to us as music educators. As schools across the country are faced with high stakes testing simultaneously with financial stress, there is also an increased pressure on students to achieve higher grades and scores on college admission tests. Music and fine arts are greatly affected by all these demands as budgets are cut and programs are dropped.

Two measures that are often used as indicators of academic achievement are grades and standardized test scores. It has been my passion to research and present findings which prove that music is contributory to students' success in academics. Administrators, who ultimately will determine the role of music and fine arts in the U.S. schools, will only make music an integral part of the curriculum if they are aware of the academic and aesthetic merits of having a music program. The decision to support music cannot be made without knowing music's effect on academic achievement and its contribution to a student's education. Handbells and handchimes can and should be an essential part of the music curriculum, leading to student success not only in music, but also in academics.

Research studies starting in the 1990s have shown that students who listen to music have higher spatial scores on intelligence tests (Rauscher et al., 1994). Spatial intelligence is the ability to form mental images of physical objects. What better tool is there than handbells to develop the ability to form mental images of both the music and handbells while playing? I n a series of studies conducted by the College Board, it was found that music and art students consistently scored significantly higher on both the math and verbal sections of the SAT (Scholastic Aptitude Test). The data was gathered by the Student Descriptive Questionnaire, a component of the SAT that provides information about students' academic preparation. Students' response rate to the questionnaire was high 95 percent and studies document the accuracy of self-reported student information (College Board, 1990, 1991, 1992, 1993, 1994, 1995; Krum, 1994). In 1996, research by the College Entrance Examination Board found that on the SAT music students scored fifty- one points higher on the verbal and thirty-nine points higher on the math sections of the test than the national average (Campbell, 1997).

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Case studies conducted in high schools to assess academic success found that the cumulative GPAs of music students were significantly higher than those of non-music students and that students' achievement in reading, writing, and math improved when arts are included in the curriculum. (Mickela, 1990; McCarthy, 1992). Music students also had significantly fewer days absent than non-music students. The conclusion drawn was that music students reach higher academic achievement levels in academic studies than non-music students.

Approved curriculum and accountability guidelines dictate that students maintain high levels of achievement and that no student is left behind. The evidence from research strongly suggests there is a correlation between music instruction and high grades and/or test scores. The study of music helps to make that possible by developing critical thinking skills and improved skills in reading, writing and math. The ability to solve problems necessary in some branches of mathematics is facilitated by experience in music study.

In particular, the playing of handbells helps to *stimulate critical thinking and problem solving*. The process of playing bells constantly involves mental thinking and problem solving as to the correct placement of the bells, the moving around and sharing of bells, where to place bells so as to easily pick them up when needed, etc. Depending on the pieces being played, a different setup of bells per part may be required for each piece of music. Certainly, the movement and placement of bells per part is unique to each piece. For example, an F5-G5 player does not always need to play G with the right hand and F with the left hand if the piece dictates otherwise. Moving the bells where it is easiest to play them and get to them is a component of critical thinking and problem solving which goes on constantly during handbell playing.

As a high school handbell teacher, I have been amazed by the solutions my students have come up with regarding the placement and playing of bells on the table. Prior to rehearsing one day I found an A#5 bell sitting by the B6-C7 position. When asking my students who put it there (thinking it might be a practical joke on the A5-B5 ringer), I was told that the A5-B5 ringer gave it away because the tempo of the piece being played was so fast as to prohibit playing the A# cleanly by one person. My students said, "You want it to sound good, don’t you?" Well, I was quite impressed. When I asked how the A#5 would be returned to the correct position (since we do not have duplicate bells), the students said, "Oh, don't worry Ms. K., we have that covered!" That is one example of problem solving in action. I have found after 15 years of teaching high school that students rarely tell me they can't do something. If they can't personally play it, they will find a solution or a way to get it done.

Students are constantly solving similar problems in handbell ringing. They like challenges and will figure out potential problem areas by coming up with alternate solutions, sometimes with my help and sometimes on their own. Actually, those bell choirs that own duplicate bell sets do not get the opportunity to develop their problem solving and critical thinking skills to the same extent as the choirs with only a single set. Problem solving and critical thinking are necessary in handbell ringing because the positioning and moving around of bells is critical to handbell playing. It is unlike a keyboard, where all the keys stay in the same place. Successful handbell playing requires the moving of bells and the mental discipline to keep everything straight. This develops the same skills necessary for academic success.

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Hand in hand with critical thinking and problem solving is the development of eye-hand coordination and motor skills. The coordination and motor skills developed by playing a musical instrument transfers to writing skills. Music develops perceptual skills necessary in many academic areas (Dryden, 1992). There can be no better way to develop eye-hand coordination than by playing bells or chimes. It doesn't matter whether a student is playing one bell or three at a time. Their coordination skills are being developed by the act of ringing and reading music simultaneously. The rhythm of music transfers to the rhythm of reading. Auditory discrimination developed by instrumental study helps develop phonetic skills. Memory training, listening, recall and concentration are all skills developed in music and handbell study that transfer to academic areas.

Listening and concentration are key in handbell playing because each handbell ringer has a part different from every other part. No part is duplicated in handbells. No one can "fake" handbell playing by copying or following along with those around them. Ringers are on their own and must carry their own weight in order for the music to be successfully performed. This is much different from a vocal choir, orchestra, or band, where there are groups of musicians playing or singing the same part. Handbell ringers must be independent, relying on their own ears and ability to follow the music and perform their part while all those around them are playing different parts. This develops concentration, listening skills and mental discipline all necessary for academic success.

Another reason music transfers to other subjects is that cognitive and higher order thinking skills are developed in music. The level of energy necessary in music and the ability to organize time and self-discipline are developed through the study of music and handbells. Skills developed in music that apply to other areas are a sense of rhythm, physical coordination, motor skills, critical thinking, memory recall, listening, and logic. Music improves the development of reading skills in slow learners (Dryden, 1992).

Music instruction increases achievement in mathematical skills. Studying music enables students to learn multiplication tables and math formulas more easily (Mickela, 1990). Music study increases perception and critical thinking skills. These are skills that correspond with logical skills. Long after the formulas learned in a music theory or handbell class are forgotten, a person may use the ability for logical thinking that was developed in the class to solve problems quite unrelated to music; may use the discipline cultivated in a handbell performance class or creativity cultivated in a music class to solve problems quite unrelated to music; may retain a lasting appreciation of the aesthetic qualities manifested in music forever.

Music education is more than learning to sing or play an instrument. It is more than entertaining or pleasing an audience. It is more than a pleasant diversion or recreation. Music is a science, a mental discipline, and an art. It has a mathematical foundation; it is a language and physical activity. Any subject that combines science, discipline, language, math, physical activity, and art must not only be worthwhile but absolutely essential to the education of our children. Music incorporates every other area of study in some way.

Music instruction is a powerful tool that educators can use to promote academic achievement and mental discipline. The introduction of handbells or chimes into an existing music program will revitalize and establish music learning experiences for those students who do not sing or play a band or orchestra instrument. Bells and chimes will involve those students who would otherwise be on the fringe of a music

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program. I have found this out firsthand, In the high school where I teach, handbells is only one of the music classes offered, but students enjoyed it so much that it went from being an extracurricular group before school to being offered as a class during the day in three levels -beginning, intermediate, advanced. Today over 200 students in the school enrol in a handbells class each year; that is one-fifth of the total school enrolment. This is a school known for its many athletic championships, and the majority of the football players or "jocks" sign up for a handbells class. They not only take the beginning class, but go on for all three levels and continue to repeat the advanced level until they graduate. This is a school that also prides itself on academic achievement. Handbells play a big part in helping the students achieve academic success.

The contribution music makes to the academic achievement of students is often ignored in today's schools. It is time for U.S. educators to consider the inclusion of music in the school curriculum more carefully. The effect of music on brain functions and academic activity should be further explored. Administrators need to incorporate music courses as requirements, not just electives, in their school system. Serious money should be funnelled into music programs for academic concerns, not just for trip expenses or uniforms. Money should be designated for buying handbells or chimes. Music educators should focus on the education of students instead of promoting the next competition or performance. They need to see how music shapes the education of our children academically as well as aesthetically. Only when it is too late may schools realize what a tremendous source of untapped power has been lost.

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As a handbell and choral music teacher, I am rewarded by the realization that I am providing the students a challenging and creative environment, building their skills, and contributing to their success in the other academic disciplines. This is why I teach music.

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