

Composition Enhances Performance on Verbal Fluency and Mathematical Computation in Fifth-and Sixth-Grade Students

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Abstract

We evaluated the short-term and long-term effects of composition classes (Composers in Public Schools (CiPS)) on cognitive skills essential for academic success. These skills included processing speed, verbal fluency, and vocabulary and arithmetic performance, and music reading skills in fifth and sixth-grade students. We hypothesized that composition instruction will increase performance on music-specific skills such as music reading and analytical and aural skill development associated with vocabulary, arithmetic, and processing speed abilities. General music classes from three elementary schools (N=48; mean age 10.8 years; 28 males and 20 females) and two middle schools (N=41; mean age=11.2 years; 17 males and 24 females) participated in two sessions of pre-testing, each 40-minutes, prior to the initiation of a novel composition program. Upon completion of the composition program, both groups of students participated in post-testing to further examine potential domain-specific and cognitive enhancements. Results indicate significant enhancements on the *Music Reading Assessment* (MRA; Bugos, 2006), *Delius-Kaplan Executive Function System* (D-KEFS, Delius, Kaplan, & Kramer, 2001) *Verbal Fluency* subtest, and the *Wechsler Intelligence Scale for Children* (WISC-IV; Wechsler, 2003) *Arithmetic*, *Coding and Symbol Search* subtests. No significant differences were found for performance on the *Vocabulary* subtest of the WISC-IV. Overall, results indicate that the Composers in Public Schools program not only enhances domain-specific learning in music-reading skills, but may increase other skills important in learning such as verbal fluency and arithmetic performance. The transfer of knowledge related to musical notational symbols, sequence creation, and analytical compositional concepts may influence other skills requiring analysis (arithmetic) and creativity (verbal fluency).

Program Overview

The Composers in Public Schools program provides opportunities for students to create music while learning specific compositional and stylistic concepts. Each unit of

instruction consisted of various compositional experiences integrated with technology. Lessons included composing for a “virtual orchestra,” percussion pieces, vocal and instrumental blues pieces, recorder and ensemble pieces as well as vocal compositions. Students participated in discussions about compositional techniques such as sequence and retrograde. Demonstrations of concepts and active participation in learning compositional concepts serve to promote a sense of ownership.

At the elementary level, the Composers in Public Schools (CiPS) program consisted of eight-months of weekly composition instruction administered by a Professor of Composition and highly trained graduate composition students. Graduate composition students were trained in the curricular content of the program, required to observe instruction, and meet regularly with the professor to discuss program performance. Participants at the elementary level consisted of fifth-grade students who received bi-weekly general music instruction. Individual elementary music educators provided basic rhythmic notational instruction to students and background information about composers prior to the integration of the CiPS program. Each music educator systematically incorporated compositional skills taught by composers in conjunction with prior developed lessons to ensure compliance with state and national standards.

Two sixth-grade general music classes also participated in the program and received weekly composition instruction for four-months (half the duration of the elementary program), since middle school general music courses are daily semester-based courses. Despite short-term exposure to the CiPS program, sixth-grade students demonstrate similar performance on cognitive assessments, including significant gains in arithmetic and verbal fluency. Data also indicate domain-specific gains in music reading, an integral part of CiPS. Results of this pilot program suggest that composition may have the capacity to enhance other cognitive abilities in addition to domain-specific learning.