

# The Relationship Between Integrated Instruction in Music and Mathematics and Young Children's Creative Thinking Skills

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## Abstract

This collective case study investigated how integrated math and music instruction may be related to the development of creative thinking skills among young children. Over the course of a year, researchers observed integrated lessons as they were being presented to two classes of pre-K students enrolled in an after school enrichment program titled *All Aboard: The Music and Math Connection*. Field notes were kept from each of these observations. Additional data include parent interviews, classroom teacher interviews, and creativity assessments of each child enrolled. Data analysis revealed that young students combine learning concepts during integrated instruction in multiple ways. Analysis also revealed that integrated instruction combining concepts in mathematics and music can stimulate divergent thinking among young children and continued practice in divergent thinking may influence a child's creative abilities.

## Key Findings

### *Integrated Learning Concepts in Math and Music*

- Pattern recognition is dominant throughout both the written and practiced curriculum. Evidence from these cases demonstrates that children can cross subject boundaries and use understanding in one subject to inform understanding in another.
- The *All Aboard* curriculum makes use of multiple story characters to help children identify both mathematical and musical concepts. Recognition of these characters is closely linked to concept development among the children in this study. Evidence shows that character recognition appears to trigger certain thinking strategies that often call on previous learning in both subject areas to increase current understanding.



- Physical analysis of data, particularly graphing activities, allows for the most powerful combinations of music and math concepts in this instruction.
- The challenge-based aspects of the curriculum where students are required to actively solve problems using knowledge and skills from both subjects appear to be highly effective integration techniques for pre-K children.

### *Divergent Thinking*

- There is evidence in this study that suggests the concept-based curriculum on which *All Aboard* is founded allows for broad

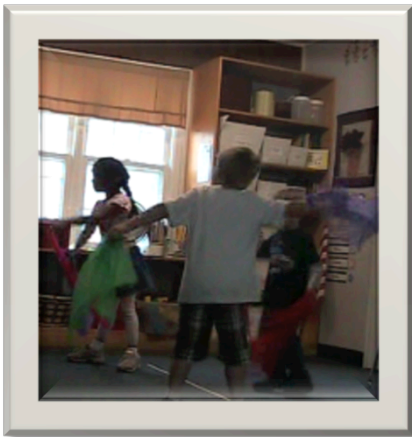


instructional applications that can accommodate child-initiated and child-directed learning.

- The ability to think in both a mathematical language and a musical language simultaneously allows children in this study to develop divergent thinking strategies, fostering the development of highly complex ideas.
- Combining music with mathematics appears to allow the latitude for multiple solutions to problems. Since there is more than one way to sing a song, children appear to accept more than one way to solve a math problem.

### ***Practice in Divergent Thinking and Creative Ability***

- Length of enrollment in *All Aboard* has some impact on the divergent thinking demonstrated in problem solving and creativity among the children in this study. It appears that with increased practice, divergent thinking increased among these children.



- Creativity assessments revealed that high levels of fluency, originality and imagination were found among children enrolled in *All Aboard*.
- Studies show that increased levels of divergent thinking can predict creativity later in life. The relationships observed in this study between *All Aboard* and the development of divergent thinking skills in young children, suggests that this curriculum could impact the creative thinking skills of children later in life.

### **Conclusions**

It appears that under certain conditions, some children can engage in integrated learning in ways that may have previously been considered impossible for children their age. This type of learning appears to develop a habit of practice that allows these children to apply integrated understanding and inquiry to many different situations. Through the application of this habit of practice, some children may develop increased divergent thinking abilities or at least a disposition of acceptance toward divergent thought. Previous research suggests that an increase in divergent thinking abilities impacts the development of creativity among children. With this evidence, it appears that *All Aboard* should be considered a viable curriculum for the development of creativity among young children that can impact their thinking for the remainder of their lives.