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INFUSING MUSIC IN AN ACADEMIC CURRICULUM

by
Katelyn E. Frevert

A Thesis

Submitted in partial fulfillment of the requirements of the
Master of Science in Teaching Degree
of
The Graduate School
at
Rowan University
June 18, 2009

Approved by _____
Advisor

Date Approved June 18, 2009

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ABSTRACT

Katelyn E. Frevert
INFUSING MUSIC IN AN ACADEMIC CURRICULUM
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Master of Science in Teaching

The purpose of this teacher research was to examine the effects of music on student comprehension, cooperative learning and the surrounding learning community. This study was conducted within a third grade inclusion classroom. The students were exposed to educational songs in mathematics, writing and science. The students were also provided with the opportunity to create their own songs about matter and showcase them through their production of music videos. Data for this study was collected through video recordings, student interviews, teacher interviews, and teacher/researcher observations and journal. This study demonstrated that music has a positive effect on the learning environment and student comprehension. The study's findings also suggest that music can contribute to creating an exciting and welcoming learning environment in which the students demonstrate an overwhelming desire to learn.

ACKNOWLEDGEMENTS

To all of those whose paths I've crossed while on my musical highway headed towards achieving my dreams, I thank you. It would be simple to create a list of those who assisted me along the way but this project was inspired by the many children out there who struggle in school on a daily basis. I am extremely grateful to those who supported me on this musical mission, but this is for all the students at J.F. Cooper Elementary, room 113, who made this possible and for all the students I will hopefully inspire in the future to become what they are destined to be.

This is also for my Nana, someone from whom I learned that it takes hard work and dedication in order to fulfill your dreams. Unfortunately, she was unable to witness her youngest grandchild achieve such great success but I know she was by my side every step of the way. Although I have created many memories from songs throughout this project, the one song I will always keep in my heart for my Nana is "Only the Good Die Young." Don't worry, I did good Nan!

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Chapter I

Scope of the Study

Introduction

“In every successful business...there is one budget line that never gets cut. It’s called ‘Product Development’ – and it’s the key to any company’s future growth. Music education is critical to the product development of this nation’s most important resource – our children.”

- *John Sykes — President, VHI*

Purpose Statement

Students are taught new skills in the classroom on a daily basis. The job of the teacher is to provide students with the skills necessary for them to be successful within society. The problem is the focus of the curriculum has gone from providing students with skills necessary to be successful within society to teaching to the test. Children are unaware of the importance of these skills because many teachers are not providing students with hands-on experiences in which to apply what they have learned. This concern for increasing test scores has caused teachers to stick strictly to the curriculum, creating a class of passive learners. The expectations of the students is for them to learn the new information, practice it and then demonstrate their knowledge, without gaining the proper understanding of why the information they are learning is important to their life. According to Heyl (2008), “The curriculums in many schools are designed to promote success on standardized tests, but many students are still scoring below the basic level on these tests. Most schools expect these students to learn through direct instruction

and then practice these new skills worksheets. The students are then assessed on these new skills through tests and quizzes not allowing these students to see how this new information may be applied outside of the classroom” (p. 6).

An effective solution to solve this problem would be the implementation of project-based learning within the classroom. During project-based learning, “instruction must be based on experiences where students build upon their previous knowledge to construct new knowledge, with guidance from the teacher” (Heyl, 2008 p. 8). Students are provided with an assortment of projects to choose from and allowed the ability to create their own final product that demonstrates what they have learned throughout the time they spent becoming an expert on their topic. These projects promote “purposeful activity”, because they emanate from the child’s own interests and provide intrinsic motivators for these students (Wolk, 2006). Instead of looking to the teacher for answers and direction, they are actively involved in finding their own answers, following their own direction and fulfilling their own educational desires. These projects are designed to allow students to take part in their own learning process.

Along with the lack of choice allotted to the students, many schools ignore the idea that each student learns in a different way. Most classroom teachers rely on letters, words and numbers in order to communicate with their students, but many students have altering intelligences that allow them to express themselves beyond numbers and letters. Howard Gardner developed the concept of each individual having eight intelligences, linguistic, mathematical-logical, bodily kinesthetic, music, intrapersonal, interpersonal, naturalistic and spatial. The presence of these intelligences varies among each individual, some intelligences being more prominent than others. Unfortunately the other six

intelligences are ignored while math and language become the prominent modes of teaching and learning within the classroom (Gardner, 1993). Project-based learning helps teachers differentiate their instruction and cater to all learners. Project-based learning and the construction of objects or pieces of work enables students to show their interests, abilities, diversity and their learning styles (Grant, 2002). According to Wolk (2006), a teacher who implements this style of learning finds that, “projects also help students succeed because they allow them to use all their “intelligences,” just as the “projects” of normal day-to-day living do” (p. 45). As all the intelligences are important there is one in particular that has struck a cord and provoked much interest. This intelligence seems to be disregarded among most curriculums due to the assumption that it does not play an important role in the cognitive development of students but research will prove otherwise.

Music intelligence is rarely focused on within the educational setting. This is due to the fact that music falls under the arts, a program typically cut due to budget shortages. As stated by Howard Gardner “music and art are the first to go whenever there is a financial crunch...Arts education may be important in kindergarten but by the eighth grade it is not longer important unless the child is professionally oriented” (Brandt, 1988). Administrators feel the lack of importance when it comes to music and the arts but evidence proves that music is a beneficial tool when instructing students. The left and the right brain function independently but music has a way of joining these individual hemispheres. Research conducted by Davies demonstrates that “music synchronizes the right and left hemispheres of the brain” (2000, p. 1). Other researchers discovered that “the left hemisphere analyzes the structure of the music and the right hemisphere focuses

on the melody” (Breitling, Guenther, and Rondot, 1987; Campbell, 1986). Emotions are stimulated through this process, which promotes attention, focus and motivation.

According to Davies, “once a student is motivated and actively involved, learning is optimized” (2000, p. 1). Along with affecting the brain, music taps into a person’s emotions. Music allows students to express themselves in ways they are not being provided within the classroom. Appel states that “the arts stimulate the brain and ignite creativity, providing students with the opportunity to critically interpret the world around them” (2006, p. 15).

The use of music in accordance with project-based learning would provide students with the ability to become experts on specific topics, construct a project detailing the elements of their topic and the use of music to express what they have learned. Project-based learning and music both allow students to create meaning for what they have learned. Research shows the benefits both concepts have had within the classroom. Music enhances spatial and temporal reasoning, along with mathematical reasoning. There has been noted improvement in literacy such as performance on the verbal section of the SAT and increased fluency for non-native speaking students. Music also helps students gain a “positive self-concept of themselves along with self confidence” (Appel, 2006, p. 15).

Project-based learning was used in New York Harbor School and was proven to increase test scores among all students. Originally 90% of the students entered the school below grade level in reading and math. After partaking in this school’s maritime curriculum “79% of the students passed math a and nearly that amount aced living-environment science, global history, and geography” (Schibsted, 2006, p. 28). With this

passage rate, Fisher anticipates that “up to four-fifths of Harbor’s senior class will graduate in 2007” (Schibsted, 2006, p. 28). The infusion of music and project-based learning within a classroom provides a learning community in which the students have a choice, a say in their learning process and the students and teacher are working equally in order to achieve success.

Statement of Research Problem and Question

The use of standardized tests began with Alfred Binet’s creation of the IQ test. Since the exposure to this type of assessment, most states and school districts have implemented a style of learning and assessment, in which direct instruction is employed to teach new skills. These skills are practiced through the use of worksheets and quizzes, not allowing students to see how this new information may be applied outside the classroom (Heyl, 2008). The varying types of tests implemented among each state serve similar purposes. These tests require students to display a general knowledge base of specific skills taught in the classroom. Gardner coined this requirement of general skills as the “uniform view of schooling”, which calls for a homogenized curriculum (1993). This uniform view prefers that all students study the same subject matter and that each student is taught the subject matter in the same way, not allowing for the necessary use of differentiation. Unfortunately, these tests also only cater to those subjects that easily lend themselves to be assessed, thus disregarding the arts, which are not valued within the uniform school (Gardner, 1993). This uniform style of educating students has caused many teachers to teach through item teaching, which means they organize their instruction around specific questions that will most likely be found on the test (Jerald,

2006). Ultimately, this instruction does not allow for differentiation, real-life application or the use of the arts.

The disheartening exposure to these facts helped motivate me in finding my question. I wanted to find a way in which music could be incorporated into the classroom curriculum along with project-based learning. I came up with this idea. What happens when music is infused within an academic curriculum and further enforced through project-based learning? Other sub questions that arose based on this research question are: How can music be incorporated in the classroom? Is music an effective teaching tool, allowing students to remember the information better or make further connections? What effect does music have on cognitive development? How effective is project-based learning? How have other classroom teachers used this type of learning within their classroom? Does project-based learning help students develop independence or leadership skills? What type of learning community do project-based learning and music promote?

Story of the Question

“Miss Kate did you bring your Ipod and boom box in today?” was the first question I faced everyday, over the past two summers, from the children at the summer camp I worked at. For the past two years I have been a counselor at the Boys and Girls Club in Glassboro, New Jersey. Without any training or introductions I was thrown into this position as a summer camp counselor in which I had to engage these students in art centered activities. From looking at all the faces that surrounded me on that first day I could tell this was a group of active children. Not one student was able to remain in their seats for an extended period of time without tapping their feet, walking around, making a

beat on the table or singing a song. I asked myself, "What is the one thing that will allow these students to be active and express themselves in any way they would like?" The answer I came up with was music.

As I took my boom box and plugged it into the wall I could see the excitement build up among all of my students. When I looked back up, each of my students' hands were raised, waiting to request a song for me to play. As I picked a song and hit play each and every student got up out of his/her seat and began to dance, sing or follow along with the beat. It amazed me to see how engaged these children were by this music. As I walked around I noticed that not one student missed a note, a lyric or a beat, they knew these songs inside and out. Not only did they know every word by heart but they were also able to teach me the choreographed dance that went along with each song. During this moment of astonishment I had to ask myself, "How is it that these children know every word to every song I play on my Ipod, but when it comes to addition or subtraction facts, or reading a book these children struggle tremendously?" This was the very moment I knew I had discovered the topic for my thesis.

Music has been part of my life since I began attending school as a little girl. I remember singing at all of our school concerts, playing the bells in 5th and 6th grades and playing the saxophone for seven years. Music is my cup of coffee in the morning and the boost I need to get through my day. I constantly have a tune running through my head and a rhythm running throughout my body. I feel lost without music because music is my language; it is the one way in which I feel I can express my whole self. That day I let the music play in my classroom I realized that most of my students felt the same way. I had found the one way in which I could effectively communicate with my students.

It was after this experience when I realized how I could effectively use music to educate these students along with my future students. As I mentioned, each student knew the words to every song that came on along with the beat and the dance. If children are motivated and inspired by the freedoms music provides them, why not incorporate this inspiration, motivation and love of music into the classroom curriculum? We use music effectively as a tool to educate students in pre-kindergarten and kindergarten. Each of these students will always know the letters of the alphabet, the days of the week, months of the year or how to line up properly due to the simple fact that these teachers used educational songs to teach their students. Once these students have graduated from these grades, the use of music is seen less and less within the classroom. Why remove something that has been proven to be successful?

It is upsetting to see students at such a young age who dislike coming to school every day due to the unengaging tasks they must perform on a daily basis. They unfortunately do not see how fun learning can be, something that music provides to all. They are also not provided with experiences that allow them to apply the skills they learn in the class in real life, hands-on experiences. I am a firm believer in the idea that learning should always be fun and practical. With the use of music and the ability to create projects, which allow students to apply what they know, students will gain a better understanding of the importance of school and the skills being taught to them. Students will realize that learning is fun and school will provide them with the opportunity to strive for what they truly want. I believe in music because it provides people with the opportunity to express who they are and how they feel. By allowing these students the same opportunity, there is no telling where it will take them.

Organization of Thesis

The chapters to follow will take an in-depth look at the effectiveness of using music along with a project-based learning curriculum within the classroom. Chapter two will supply the reader with research explaining what project-based learning entails and how to incorporate this type of learning into the classroom. Examples will be provided in order to demonstrate how educators have successfully used this form of learning to educate their students. There will also be statistics provided to show the positive outcomes this type of learning has on students. This literature review will slowly transition into an examination of the use of music as an educational tool. Articles will be presented which explain the effects that music has on a student's sense of self, cognitive development, creative abilities and why music would be a beneficial tool to use within the classroom. Along with its noted effect on the brain, music has been identified as one of Gardner's eight multiple intelligences, along with other reasons. This review will take a look at Gardner's multiple intelligences and how schools only focus on two of the eight intelligences when educating students. This review will end with a look at how one school incorporates music within the project-based learning approach.

Following this chapter will be a detailed section describing the context in which this study takes place. It will also identify the research design and methodology employed throughout this study. The final two chapters will examine the results of this study along with implications for further research.

Chapter II

Literature Review

Introduction

The use of standardized tests is rooted in Alfred Binet's creation of the Intelligence Test, to determine a person's IQ (Binet & Simon, 1905; Block & Dworkin, 1976). This method of assessment gained much appeal from Americans and became the dominant feature of American education and assessment (Gardner, 1993). This use of formal assessments infiltrated every school throughout the country through tests such as Stanford-Binet, the California Achievement test, Scholastic Aptitude Test and State Tests. Each of these tests requires students to display a general knowledge base of specific skills taught in the classroom. Gardner coined this requirement of general skills as the "uniform view of schooling", which calls for a homogenized curriculum (1993). This uniform view prefers that all students study the same subject matter and that each student is taught the subject matter in the same way. In order to determine student progress each student is then required to take the same test, without any differentiation. Only those subjects such as math, science, language arts and history are found on these assessments. Unfortunately, those subjects that do not easily lend themselves to be formally assessed, such as the arts, are not valued within the uniform school (Gardner, 1993).

This snowball effect of events pertaining to the implementation of standardized testing provides the motivation for the topics discussed in this literature review. The anxiety these tests promote such as job security, student promotion and graduation causes

teachers to teach to the test (Smyth, 2008). This type of instruction follows along with Gardner's explanation of a uniform school in which all instruction is homogeneous. Many teachers teach through item teaching, which means they organize their instruction around specific questions that will most likely be found on the test (Jerald, 2006). This instruction does not allow for differentiation, real-life application or the use of the arts. The following information within this literature review seeks to demonstrate if the use of music and project-based learning within the classroom, as teaching tools, will affect student progress.

The first topic discussed is project-based learning. The pressure of these high stakes tests has forced instruction to change from exploratory, to teaching to the test through the drill and kill method (Smyth, 2008). Instead of allowing students to take the next step and apply the skills taught to them, teachers choose to move on to a new skill, in order to make sure all the required material is covered. Heyl argues that although curriculums in many schools focus on achieving success on standardized tests, many students still score below the basic level on these tests. Heyl (2008) writes: "Most schools expect these students to learn through direct instruction and then practice these new skills on worksheets. The students are then assessed on these new skills through tests and quizzes; thus not allowing these students to see how this new information may be applied outside of the classroom" (p. 6).

The main idea of project-based learning is to allow students to employ the intelligences most beneficial for them. These intelligences were created by Howard Gardner and will be discussed in the section following project-based learning. The eight intelligences will be described in detail along with their importance within the classroom.

The final topic that will be discussed focuses on one of the eight intelligences, music. This section will provide an overview of how music affects the brain and cognition, creativity, academic achievement and effective ways to incorporate music within project-based learning.

Project-Based Learning

Project-based learning is a curriculum approach that stems from the writings of Dewey (1938), Bloom (1956) and Gardner (1983) (Fischer, 2007). Project-based learning is rooted in the idea that learning is an active process in which students are able to apply all that they have learned, in order to construct new ideas (Heyl, 2008). In order to promote active learning within the classroom, teachers must examine the type of instruction they are providing to their students. Heyl (2008) states that, “instruction must be based on experiences where students build upon their previous knowledge to construct new knowledge, with guidance from the teacher” (p. 8). As students evoke their prior knowledge, they also engage in high-order thinking, analysis, synthesis and evaluation (Bonwell & Eason, 1991). These skills are then applied through projects, the major premise of project-based learning. Projects may be identified as complex tasks centered on challenging questions or problems that involve students in design, solving problems, decision making and research. These projects are student-driven, allowing students to work independently over a period of time and then culminating their investigations with realistic products or presentations (Jones, Rasumssen, & Moffitt, 1997; Thomas, Mergendoller, & Michaelson, 1999). These projects promote “purposeful activity”, because they emanate from the child’s own interests and provide intrinsic motivators for these students (Wolk, 1994). Project-based learning also allows students to make

connections from experiences they encounter in the classroom to their home and community experiences (Knodt, 1997). Brown, Collins and Duguid examined how the use of real-life applications through project-based learning affects the learning process of students. They found that learning is maximized if the context for learning resembles the real-life context in which this material may be used, while learning is minimized if the context in which learning takes place is different from the context in which the learning may be applied (1989).

Wolk's study (1994), in Illinois, truly embodies the project-based learning approach. Each day the students engage in two one-hour project times. In the morning the students are provided with the opportunity to investigate anything that interests them. They may study anything as long as it is beneficial to their educational success. In the afternoon the students are allowed to explore. Students explore topics that are student initiated, after great discussion; some examples are "Equality and Prejudice" and "Our Urban Ecosystem" (Wolk, 1994). Projects may also follow the fifth grade curriculum. Before beginning their projects students must create a plan and have it approved by the teacher. The plan must provide questions the student wants to answer, resources, their projected idea of how to demonstrate their new knowledge, when their research will begin and end, and when they will present their project to the class (Wolk, 1994). Students then write up a self-evaluation on their project allowing them to see what they have learned.

Wolk does not confine his students to the resources in the classroom. Students are allowed access to the computer lab along with the library. Although students may be working on different projects, this type of learning creates a positive learning community.

Wolk observes in his study that when the work is really flowing, there is a certain feeling in the air: students are into their work and they are constantly interacting and collaborating with one another (1994). These students are highly focused and by the time two thirds of the year has passed the students have created more than 60 projects. These projects provide students with the ability to choose what they want to learn about, the direction they want to take, how long the project will take them and what they would like to create in order to educate others. This choice allows students to become active participants in their learning process (Wolk, 1994).

Another school, Brooklyn's New York Harbor School, is experimenting with project-based learning by implementing a curriculum that provides students access to water. Fisher, the founder of the school and curriculum, wanted to "start a school that provided urban kids, especially those from poor minority communities, hands-on experiences in dealing with water" (Schibsted, 2006, p. 27). This school immerses students in hands-on nautical courses such as Harbor-Science class. Students experience the maritime theme through science as well as math, history, and English classes as much as possible (Schibsted, 2006).

Students learn from Newton Creek, one of the most polluted bodies of water in their area. They are engaged in an assortment of projects before, during and after their visits to the creek. They use their geography skills in order to figure out where the creek is in relation to their school and then plan out the best route to take in order to get there. Once at the creek students participate in three stations. One requires the students to record what they see in a field notebook, using any form of writing they choose. Another station asks students to work with the water, testing it, recording their results and

analyzing the data. The third station allows students to board a scientific-research vessel. While on this vessel the guide educates the students on the different sites surrounding them.

In English, the teacher struggled to think of a variety of ways to incorporate this maritime theme in a way that would help her meet all the curriculum standards. She was able to collaborate with students and come up with projects together. Her tenth graders decided to become pen pals with a Waterkeeper group and create a website exhibiting their correspondence. This correspondence allows students to improve their vocabulary, sentence structure, grammar and writing. The teacher conducted a debate among her ninth grade students in which the two groups, the General Electric and Waterkeeper Alliance groups had to defend which group should clean up the PCBs in the Hudson River. Immersing these students in practical applications allows them to make the proper connections to the world around them.

The results of these students' scores on the New York State Regents Exams show a drastic improvement from previous years. Originally 90% of the students entered the school below grade level in reading and math; however after completing this school's maritime curriculum 79% of the students passed math a and around that same amount aced living-environment science, global history, and geography (Schibsted, 2006). With this passing rate, Fisher anticipates that "up to four-fifths of Harbor's senior class will graduate in 2007" (Schibsted, 2006, p. 28). This program suggests proof that teaching to the test does not allow students to apply the skills they have learned and eliminates the opportunity for teachers to teach higher-order thinking, reduces creativity, and varied teaching strategies (Darling-Hammond, 2004; Smyth, 2008). Teachers and students

gained, through experiential learning, experiences that they will carry with them the rest of their life. This is the main goal of Harbor School, which aims to instill in students the “confidence and skills to navigate and achieve life goals, beginning with a college education” (Schibsted, 2006, p. 28).

Benefits of Project-Based Learning

Upon the surface, project-based learning allows students to control their education. They are allowed to take a dynamic and energetic role in their learning process. Research demonstrates a drastic increase in student achievement on standardized tests among students who have been exposed to project-based learning. A study conducted in an inner-city school in Boston, showed that this school exhibited the second highest scores in the district, scoring right behind an exclusive school, Boston Latin School (ELOB, 1999). Another school in this district also ranked 11th in mathematics and 17th in reading out of 76 elementary schools (ELOB, 1999). Another study conducted in Portland, Maine, (1995-1996) examined the effects of using project-based learning within the curriculum. This study found that this middle school showed increases in all six curriculum areas assessed with the Maine Educational Assessment, contrasting with the lack of improvement the year prior, along with the results of the entire state (ELOB, 1999). Along with improving educational success among students, project-based learning has been noticed to influence the school climate and student motivation (Thomas, 2000).

Project-based learning fulfills a much deeper purpose than what meets the eye. For students who experience project-based learning, learning becomes more enjoyable, motivational and effective. This active learning often boosts egos where as passive

learning can increase frustration levels (Petress, 2008). According to those who observe students who participate in project-based learning, they notice that this active learning stimulates pride, increases confidence and imparts credibility in the eyes of the teacher (Petress, 2008). It creates a thirst for broader and deeper understanding in future academic endeavors and makes learning personally satisfying (Petress, 2008). Active learners are not seen as taking a back seat to learning. They are involved, always asking questions, invoking discussion, sharing ideas with others, creating, building, fixing, exploring and learning.

Project-based learning allows students to employ skills otherwise not used within the “drill and kill” classroom environment (Jerald, 2006, p. 2). Project-based learning allows students to reflect upon their work, and fosters positive cooperation among peers in their contributions to the learning community. They become an expert within a certain area of study, and ultimately model work that they will be able to use within the community, while exercising their intellectual strengths (Csikszentmihalyi, 1991).

Project-based learning and the construction of objects or pieces of work enables students to show their interests, abilities, diversity and their learning styles (Grant, 2002). Wolk (2006) states in his study “projects also help students succeed because they allow them to use all their “intelligences,” just as the “projects” of normal day-to-day living do” (p. 45). By catering projects to student’s strengths, projects allow for differentiation in many areas such as content, process, product, readiness, interest, and learning profile (Fischer, 2007). Projects are not seen as generic but are shaped according to the student’s abilities. Knodt, an educator employed the use of the Think Tank in her school, a laboratory that offers children a “choice of diverse, challenging activities and opportunities to develop

and practice process-oriented skills...” (Knodt, 1997, p. 2). Knodt noted that the Think Tank program permits students to use the intelligences and skill most beneficial to them. The intelligences referenced come from Howard Gardner’s theory of multiple intelligences, the backbone of the Think Tank.

Howard Gardner identifies eight intelligences in which each individual encompasses. All of these intelligences work together, but there are intelligences that prove to be more dominant than others among each individual. Knodt identifies that the projects in the Think Tank practice the ideals presented by Gardner. The projects recognize and foster all human intelligences, and every arrangement of intelligences, that make each individual unique (Gardner, 1987). In order to promote growth within the Think Tank, teachers design projects that use a student’s strengths or get children to explore areas they may be unfamiliar with (Knodt, 1997). Projects within the Think Tank layer a variety of intelligences in creative ways, among a variety of subjects. In order to effectively layer in a variety of Gardner’s multiple intelligences within a project-based curriculum, it is important that educators know what these intelligences entail.

Gardner’s Multiple Intelligences

Gardner’s multiple intelligences cover a range of subjects and skills. The first of the eight is linguistic intelligence. People with linguistic intelligence have an ability to manipulate words to form meaningful expressions while demonstrating proper grammar and a robust vocabulary (Nolen, 2003). They use language in order to relate and comprehend new ideas. The next intelligence mathematical-logical, allows a person to detect patterns, reason deductively, and think logically (Nolen, 2003). These students typically like to arrange objects and soon are able to follow long chains of reasoning

skillfully, using their abstract skills. Those who have spatial intelligence are able to manipulate and create mental images in order to solve problems (Nolen, 2003). Those who use their body in order to understand the world rely on the bodily-kinesthetic intelligence. These people are able to use their bodies in skillful ways due to their fine motor skills of their fingers and hands along with their complete control over their gross motor movement (Nolen, 2003). Interpersonal intelligence deals with a person's ability to understand others. This intelligence allows people to understand, perceive, and discriminate between people's moods, feelings, motives and intelligences (Nolen, 2003). Intrapersonal intelligence deals more with the individual. Those with intrapersonal intelligence are imaginative, original, patient, disciplined, motivated and have self-respect (Nolen, 2003). Naturalistic intelligence is the ability to relate and understand all the elements of nature. Those with this intelligence care for nature and would do what they could to protect all the elements that create this masterpiece. The eighth intelligence, of Gardner's multiple intelligences, is music intelligence. Those who have musical intelligence use sound constantly. They convey their emotions through music and have a deep understanding of pitch, rhythm, and timbre (Nolen, 2003). They feel they are best able to understand and interpret new ideas along with express themselves through the art of music. The discussion that follows supports Gardner's Music intelligence and provides researched-based information supporting the integration of music within the curriculum

Music Intelligence

With the weakness in our current economy, many institutions have to deal with budget cuts, especially school districts (Gullatt, 2008). This causes school officials to

reevaluate their expenditures and redistribute their remaining funds accordingly. These economic conditions have negatively affected the attentiveness of schools towards the arts, causing a decrease in financial funding or the elimination of an arts program all together (Gullatt, 2008). Along with the economic crisis, the “back to basics” ideals enforced over the past decade have negatively affected schools attitudes towards the arts. Many have relegated music merely as an extracurricular activity, or have withdrawn the program in its entirety (Jensen, 2000). According to Jensen, the “back to basics” ideals have caused the “misconception that music is a fringe activity-that is less than a ‘major discipline’”, which causes this societal ignorance of music (2000, p. 4).

Hart-Davis (1994) documents a conversation Ron Brandt had with Howard Gardner. During this conversation, Gardner stated that, “music and art are the first to go whenever there is a financial crunch...Arts education may be important in kindergarten but by the eighth grade it is not longer important unless the child is professionally oriented” (p. 7). Some feel that in order to justify the experience of a subject in school, results from the subject must be assessed. For most, it tends to be difficult to assess the musical arts. This difficulty in assessment has caused many to second guess the value of the arts program. Many have adopted the attitude as stated by Gardner, “if something is important, it is worth testing in this way; if it cannot so be tested, then it probably ought not to be valued” (1993, p.164). There have been schools that have created an affective system of assessing the arts. In Wisconsin, a group of arts educators created a “comprehensive quality arts assessment program that has been recognized by state leaders” (Jensen, 2000, p. 4). Jensen also researched other schools that were able to create admirable criteria for measuring and evaluating the musical arts (2000). Although

some schools have been successful in incorporating and assessing the arts effectively, most schools have overlooked the benefit music may have on education. This has ultimately caused a massive misunderstanding of music's role in human development (Eisner, 1992).

One school model, the Waldorf model, realizes the role music plays in a student's development, and has been successful with integrating music into the curriculum (Jensen, 2000). These schools allow students to spend an entire year on one project, and immerse children in community service projects, the arts and music interactions, all considered good use of class time. Teachers avoid using textbooks and downplay tests, while focusing on field trips and journal writing. The curriculum is heavily immersed in the arts, specifically music and offers jazz, choir, orchestra, etc. All of these music classes are offered along with the core subjects of math, English, science and history, all taught through the process of the arts. Although many do not condone this "loosey-goosey" style of schooling, statistics prove otherwise (Jensen, 2000). Research conducted on the performance of the students who attend these schools shows that Waldorf students exceed national averages on SAT exams, and often pass achievement tests at double or triple the rate of public school students (Oppenheimer, 1999). Many college professors also note the humility, sense of wonder and intellect embodied in Waldorf graduates (Jensen, 2000). In order to understand why the use of music within the curriculum is effective, it is important to examine the research provided on the effect of music on the brain.

It is important to first state that music is not exclusively a right-brained activity, a common misconception made by many (Jensen, 2000). Davies states that "music synchronizes the right and left hemispheres of the brain" (2000, p.1). Research

conducted on the brain while exposed to music, allows researchers to explain how music is able to affect both hemispheres and why it promotes a positive effect. Jensen (2008) provides the explanation that “music seems to activate and synchronize neural firing patterns that orchestrate and connect multiple cognitive brain sites” (p. 30). This ultimately enhances the brain’s efficiency and effectiveness as well as spatial reasoning and creativity (Jensen, 2000). A theory, called neural synchrony, takes a look at the role neurons play in the transmission and effectiveness of music on the brain. This theory states that the activation of these groups of neurons assists pattern recognition in the cortex. The multiple-site, cross-activation of the neurons, may be necessary in higher order brain functions such as music, cognition and memory (Barinaga, 1998; Calvin, 1996; Fries, 1997; Riehle et al., 1997; and Stopfer, 1997). In essence this theory suggests that music may provide a quicker track to engaging and enhancing higher brain activities (Jensen 2000). One of the studies conducted in order to prove the relevance of this theory, demonstrates that musicians indeed had far greater coherence (activity among all areas of the brain) than nonmusicians (Jensen, 2000).

One of the systems, in the brain, greatly affected by music is the memory system. Music activates the attentional system by increasing our attention to sound, timing, and perception. While listening to music, the brain is actively engaged in prediction, analysis, sequencing and encoding, forcing the brain to pay attention to auditory input (Jensen, 2000). As a person is focusing on the elements of the music playing, the music is also evoking multiple memory pathways, strengthening these systems for explicit (conscious) and implicit (unconscious) memory (Jensen, 2000). Music allows memory to be stored in multiple pathways, increasing the likelihood of retrieval. This discussion of

memory is important in relation to school, because success in school requires broad-based memory (Jensen, 2000). In order to be a successful musician, one must have a strong melodic memory. By linking these memory systems, students may accumulate even more academic success. A study done involving sixty college students showed that those who received music training before the age of twelve scored higher on tests of verbal memory (Chan et al., 1998).

The most valuable aspect of this research is the aspect in which music affects a multiple amount of memory pathways in the brain. Dowling produced a study that examined which memory system a person used when responding to quick stimuli. He noticed that the subjects relied on their procedural memory, their instincts, instead of their declarative memory, which takes time to access. Schools rely on the declarative system when educating students, a slower memory pathway, but Dowling believes that music education may enhance a person's procedural learning system, a faster memory pathway. Procedural memory develops fast pattern schema, which is stored in long-term memory (Jensen, 2000). If educators used music more often, the material will become embedded within the students more quickly and accurately. If teachers do away with lectures and teach using movement, signing and music, teachers would notice an increase in student efficiency and retention (Dowling, 1993 & Jensen, 2000).

A study conducted on nonmusicians, examines the use of music during lectures, and its affect on procedural memory. Three groups were created, one group learned about music passively through visual aids, lecture and examples, another group was taught through song, clapping and movement, while the last group received instruction through lecture. The study showed that the two experimental groups, that received

exposure to music, did equally as well as shown by the test scores, but the control group (the students who only received lectured based instruction) tested poorly. This demonstrates that explicitly engaging procedural memory is effective, and also that music may be taught through an experiential methodology and still be effective. Long term effects of this study showed that the interactive learners outperformed their counterparts, passive learners, even a year later. This happens because during the learning process students demonstrate different brain activation patterns, ultimately causing the students to store the information in a different memory pathway. This suggests that active learning, which employs the use of the procedural memory pathway, with the use of song, music and movement, promotes higher retention (Altenmuller, et al. 1999). In essence, music plays an important role in student's memory systems. Jensen states "music aids memory because the beat, melody and harmony serve as "carriers" for semantic content. This is why it is easier to recall the words to a song than a conversation. Put words to music and you will typically get better recall" (2000, p. 73). As music activates the brain, memory systems are stimulated and information is stored in alternate areas, promoting effective retention and recall of subject matter.

Along with an increase in memory, other research demonstrates the positive affect music has on the development of reading and mathematical skills. It appears that there is an overlap in the parts of the brain employed when listening to music, reading text or working on mathematical problems. A study conducted over a three-year period examined students ranging from ages seven to fifteen years old. Half of the students were exposed to forty-five-minute music lessons, five days a week, at the expense of math and reading instruction, while the control group continued getting one music lesson

a week. Studies showed that the experimental group improved their language and reading skills, and did just as well as those students who spent more time on mathematics (Overy, 1998). Another study conducted examined the effect of using piano instruction along with a math video game in order to teach mathematical skills. The results showed that the video game increased student's spatial-proportional skills by 36 percent. However, the group that was exposed to the video game and piano instruction scored an additional 15 percent higher than both groups who did not receive music instruction (Jensen, 2000). Dr. Shaw is lead to believe that piano instruction increases spatial awareness and thinking ahead, important skills necessary in math (Jensen, 2000). An increase in scores has been witnessed in reading instruction as well. A study exposed two out of three groups to music while reading text. The two groups exposed to music exhibited far greater scores compared to the group who was exposed to spoken text only (Colwell, 1994). Studies also show that students, who listen to music, while studying vocabulary words, test better than those who review words in silence (Stein et al., 1984).

Along with an increase in memory, cognition, reading, mathematical, and spatial skills, music plays an important role in how students interpret the world around them. It has been researched that young children depend on play, movement, song, dramatic play and artistic activity as a way to make sense of the world (Gallas, 1992). Music allows students to interpret the world around them with a sense of creativity. Creativity requires the use of both the left and right hemisphere, causing cross-lateral activity to occur (Jensen, 2000). Music has the ability to enhance cross-lateral activity; therefore, music can increase the length of time in the creative zone, thus increasing creativity among students (Jensen, 2000).

Extended research also provides explicit benefits of integration of music into the curriculum. It has been determined that the infusion of music across the curriculum improves cognitive development. Appel's research demonstrates that "music enhances spatial and temporal reasoning, along with mathematical reasoning" (2006, p. 15). Research has also noted a discrepancy between musicians' and nonmusicians' performance on the SATs. Studies show that students who receive four years of coursework in music average 58 points higher on the verbal portion and 39 points higher on the math portion of the SAT (Jensen, 2000). Even those students who receive a half-year of music instruction average a 7 and 10 point gain in verbal and math scores on the SATs (Jensen, 2000).

The research discussed demonstrates positive implications for the music intelligence identified by Howard Gardner. This research has demonstrated the benefits music can create when integrated within the curriculum. This is why Gardner truly believes in the arts because he feels all the intelligences are strongly embedded within the arts. The arts allow teachers to differentiate instruction within the classroom, while allowing the students to make cross-curricular connections, utilize the intelligences that are most beneficial to them and become active participants in their own learning process (Gardner, 1999a).

The current literature has focused on project-based learning and music as separate entities in order to determine the positive effects of these teaching strategies. The rest of this review will provide an explicit example of the effects of centering project-based learning on the art of music. These two teaching tools have provided multiple students with positive educational experiences. By combining these two styles of teaching, a

learning environment is created which provides students with the ability to express their educational abilities through this sense of choice, emotional and physical stimulation and active participation in the learning process.

Music and Project-Based Learning

An organization called Co-nect was able to create a program that can be implemented in schools that instills the use of music in project-based learning. This organization uses technology to help schools improve teaching and learning throughout the entire school (Slowinski et al., 2001). Co-nect created a program entitled Kids N' Music. Kids N' Music projects allow students to learn subject matter content embedded within the study of musical forms and currently engages students in multiple genres of music, such as blues and salsa (Slowinski et al., 2001). Students in Memphis worked with Kids N' Blues, exploring the Mississippi Delta discovering its influence on the creation of the blues style of music. Students in Miami, Florida examined migration patterns of the Caribbean Basin and how this may have influenced the creation of salsa music.

The Kids N' Music program has these students create a CD that provides a musical tour through the history and creation of a certain type of music, as their final project. Each student has personal ownership over the CD he/she creates. The student is in charge of song selections, songwriting, performances, artwork, and the liner notes. In order to create the final project, students must conduct research and use their creativity in order to express all they have learned.

A sample of what a student may have to do throughout this process was provided within the article. A student may be assigned immigration patterns of the Taino Indians

from Boringlien (Puerto Rico). The student would use old and new historical references in order to gain the appropriate information needed for this project. He would demonstrate his grasp of the knowledge he just acquired by writing up a brief summarizing essay. From this essay he would take the most important facts and create a folktale explaining the evolution of this style of music. He would then have to find a Puerto Rican Bomba and study the rhythm and patterns within the music. He is to then take his folktale/important facts and create an informative song that is stylistically appropriate. This song is recorded onto his very own personal CD. This CD will need a cover; something the student is responsible for. The cover includes his artwork along with liner notes. The liner notes include all the information he collects throughout all his research. Each project helps students develop skills in reading, writing, mathematics, geography, history, music and other core subject areas in accordance with state standards and local requirements (Slowinski et al., 2001).

These projects not only focus on multiple intelligences, but also allow students to become aware of real-world criteria, such as how important it is to plan, meet requirements and deadlines (Slowinsk et al., 2001). This program enforces strict deadlines for work to be handed in. Constant revisions are always being made on students CDs and liner notes. They are given specific requirements and if the teacher feels the student did not meet them she will allow the student to improve upon his/her creation. This allows students to see that in order to be successful in the real world they must produce their best work. Not only are these students learning important facts within the core subjects but they are also acquiring skills that will carry them through out their lives (Slowinski et al., 2001).

Conclusion

The implementation of project-based learning in three elementary schools in Iowa showed positive gains among student achievement. Two of the schools went from “well below average” to the district average and the third school went from “well below average” to “well above average” on the Iowa Test of Basic Skill. Reading skills, in these schools, increased by 15% in one of the schools and by 90% in the two remaining schools. Over a four-year period, these schools were able to score “above district average almost every year” (Thomas, 2000). Other supporting research identifies the benefits of incorporating music into the curriculum, such as the Waldorf schools, as previously mentioned. These schools not only provide a strong music based curriculum, but they incorporate the idea of project-based learning as well, by requiring students to work on one specific project the entire year as well as smaller projects conducted within the classroom (Jensen, 2000). This curriculum has caused students to exceed the national average on SAT exams and gain a sense of humility, concentration and intellect (Jensen, 2000). Music solicits highly complex brain functions that are used for memory, word sequencing and visualization. The rhythmic, rhyming quality makes it easier to remember specific items, engage in memory as we try to identify a song and also becomes a soundtrack for our visual memory (Glausuisz, 1997). In all, Jensen states that “music enhances the ability to create, transform, and create complicated mental representations” (Jensen, 2000, p. 36).

It is important to notice that the use of these styles of learning within the classroom promote a positive and successful learning community. Music and project-based learning allow students to experience the world around them while using the

intelligences most beneficial to them. Wolk identifies the common misconception that learning must take place within the four walls of a classroom and dispels this by stating that project-based learning allows children's experiences to not be confined to the classroom or the school. He believes that the world is out there for all to interact with (1994). Goldsmith has a similar feeling when it comes to the integration of music/the arts into the curriculum. He aims his statement towards those making curriculum decisions and states "those making curriculum decisions about ways to enhance student academic gain will find the arts to be a research-based mechanism with which to provide assistance and enhancement for achieving increased student academic success, not an area to receive either an indirect or direct cut in funding" (Goldsmith, 2003; Finch, 2004).

Chapter III

Research Content and Design

Introduction

This chapter discusses the study implemented and the context in which the study was implemented. The purpose of this study is to examine the use of music as a way to further reinforce new material taught, as well as empowering students, providing them with the ability to directly take part in their educational learning experiences.

For this study, I will be using teacher research, which accentuates the qualitative approach. Teacher research, as defined by Lytle and Smith is “systematic, intentional inquiry by teachers” (1993, p. 5). In order to collect data from this study I plan on conducting student surveys, student interviews, teacher interviews, examining student achievement on assignments, student creativity and success on their signature assignment and examining my personal teacher research journal. These tools for collecting data will allow me to assess some of the effects student centered learning has on student achievement.

Context

The Cherry Hill Public School district is made up of 19 schools: an early childhood center, twelve elementary schools, three middle schools, two traditional high schools and an alternative high school program. This is the twelfth largest school district in New Jersey and the enrollment rate will top 11,800 students this year. Cherry Hill is a township in Camden County, with a population reaching 71,586 in the 2006 Census,

making it the 13th-largest municipality in New Jersey. Cherry Hill is in the Delaware Valley, located about five miles outside of Philadelphia, Pennsylvania.

James F. Cooper Elementary is located in Cherry Hill, New Jersey. This school provides education to students in kindergarten through fifth grade. According to the *New Jersey Department of Education 2007-2008 School Report Card*, the number of students enrolled at J.F. Cooper reached 321 students. The percentage of students who speak English as their first language at home is 81.6%, while other students may be exposed to various languages such as Mandarin, Korean, Vietnamese, Albanian, Cantonese, and Gujarati. With the number of students enrolled, and educators employed, the school was able to create classes with an average of 16 students in each class. The student to faculty ratio for the 2007-2008 school year was 9.3, with the state average being 10.7. This school demonstrates the co-teaching model, in which the elementary and special education teachers collaboratively educate the students throughout the entire day. There is a co-teaching model implemented within each grade level. This school also provides the support of the recourse room and has three LLD classes. These special education supports serve the 21.5% of the students enrolled who have an IEP. This school also provides the students with exposure to technology, such as computers. Almost every classroom has two computers, and the school has three laptop carts, containing a total of 45 laptops. On average, this school spends approximately \$13,645 per student.

The study conducted within this school involves a third grade, co-taught classroom, of 16 students, with 8 girls and 8 boys. The data collected during this study focuses only on those students who returned their permission slips, signed by their parent/guardian. Every student returned his/her permission slip, allowing this study to

examine the class in its entirety. A new student joined this class unfortunately after three quarters of the study had already been concluded. He was provided with permission to participate in the video, but his minimal experience with this style of learning will not be incorporated with the data that will be presented.

Research Design/Methodology

The design of this research follows a qualitative, teacher researcher approach. This type of research is being employed because it allows the researcher to analyze and critique methods implemented within his/her own classroom. This then allows the teacher to share with other professionals, along with the surrounding school community effective or ineffective techniques researched within their classroom. According to Lytle and Cochran-Smith, teacher research generates both local knowledge and public knowledge about teaching; this is “knowledge developed and used by teachers for themselves and their immediate communities, as well as knowledge useful to the larger school and university communities” (1992, p.450). The use of this type of research is imperative with this study because the use of music within the curriculum is a relatively new idea. This type of research will allow the teacher to raise his/her own questions about the topic, without being silenced by other teachers or administrators (Hubbard & Power, 1999). The teacher researcher is in charge of the implementation of this study and may conduct it in any matter he/she deems suitable within that particular learning community.

Qualitative research permits the researcher to use many resources and allows the researcher to look at the world through a “multitude of sensory/experiential avenues” (Hubbard & Power, 1999), resembling the multisensory atmosphere promoted in schools.

It is difficult for teachers to be detached from their research, using a scientific-based approach because teachers care for their students and are always looking for ways in which they can improve their learning community. This multisensory approach allows the researcher to understand his/her students learning styles along with how they construct and reconstruct the curriculum. This research allows teachers to “identify discrepancies between their theories of practice and their own practice, along with discrepancies between their assumptions of what is going on in the classroom and their more distanced, retrospective interpretations” (Cochran, Smith & Lytle, 1992, p. 458). In essence, teacher research illuminates change and increases further inquiry.

This research is important for this study because studying the use of music as a teaching tool can be challenging. Music affects students from their brain, to listening, stress, memory, reading, math and their emotions. Many of these processes are difficult, if not impossible, to analyze through scientific-based research. Qualitative research will allow these processes to be analyzed from a different perspective, allowing the teacher to gain a knowledgeable perspective on how music may be affecting his/her students. The types of tools used to collect data range from student assessment to student opinion.

In order to gain a knowledgeable perception of the use of music as a teaching tool many assessment tools need to be executed. Student assessment will be one tool used in order to analyze the effect music may or may not be having on student progress. Student assessment will come in the form of class assignments, tests and most importantly the student’s signature assignment. Students will be exposed to educational songs among an assortment of subjects, such as math, writing and science. They will be provided with class assignments, such as worksheets, experiments or activities which allow students to

apply the information they were taught. Student achievement on these tasks will allow the researcher to examine if the use of music assisted students in performing these tasks. After they have learned these songs, worked with them through class assignments and have a firm knowledge base of how these songs are constructed, they will be provided with their signature assignment. Students will be split into three groups, according to skill level. Within these groups, each student will be allowed to pick a job they would like be in charge of. Once they are in their group, they will be required to create a song about matter, incorporating material they learned in class. Once they have constructed their songs they will create a music video, showcasing the song they created. This assessment will demonstrate the effect music has on their academic achievement and their ability to retain the information taught to them.

Another tool used during this study will be student feedback. Students will be surveyed before this study begins about their feelings towards music. They will be asked questions such as, but not limited to, what their favorite type of music is, if they like music, if they listen to music while studying or doing their homework, when they typically listen to music and how music makes them feel when they listen to it. During the study discussions will be held with different students, asking them their opinion about the music being used in the classroom. They will be asked questions such as, but not limited to, if they like the songs they have learned so far, if the songs have been helping them with their schoolwork, does the music make them excited to learn, and if they are excited to learn more songs. At the conclusion of this study, the researcher will hold a discussion with each individual student, discussing his/her feelings about using music in the classroom to help learn new information. Students will be asked questions such as,

but not limited to, did these songs help you learn the information better and how, which songs helped you the most and why, did creating your own song and video help you learn the information better why or why not, did you like using music in the classroom, and do you think that you will use music in the future when you are studying or trying to remember new information. These interviews will allow the researcher to assess the impact this study had on students academically, creatively and emotionally.

Along with student interviews, the researcher will conduct interviews with educators within the school. This will provide the researcher with alternative perspectives from other educators pertaining to the use of music as a teaching tool. The researcher will also be able to assess whether or not the use of music is a common practice within the classroom or if it is something that is rarely used. Some of the questions that will be asked of the educators in this school are, do you use music in your classroom to enhance the material being taught, why or why not, do you think the use of music during instruction is effective, do you think music should be used more often in the classroom, and what is the main factor that hinders most educators from using music in the classroom? The responses from these educators will be displayed in the chapter to follow.

Video recordings of the students working on their projects along with their final performance will be used as a tool within this study. These videos will demonstrate if the use of music and project-based learning promote a positive and affective learning community. The videos will also show if music promotes learning or hinders learning, causing more of a distraction to the students. The videos will further demonstrate if project-based learning promotes teamwork, confidence and leadership. Along with video

recordings, a teacher/researcher journal/field notebook will be used in order to reflect on the activities implemented in the classroom that incorporate music and project-based learning. This allows the researcher to reflect on the successful aspects of the lesson along with the areas that did not work. This documentation does not look at the surface but permits the researcher to examine why the lesson worked or why it did not, and what improvements can be made in order for the lesson to be successful in the future. It will dispel assumptions and provide a detailed view of what is truly taking place within the classroom. This reflection also provides answers to questions asked by the researcher, as well as, promoting new questions he/she would like answered.

Looking Ahead

The chapters to follow will discuss the findings of the study implemented within J.F. Cooper Elementary. Chapter four will present the results of student surveys, student discussions, teacher interviews, student music videos, as well as, pertinent information discussed in the teacher/researcher journal. Chapter five will draw conclusions of the study, provide limitations of the study and detail implications of the study.

Chapter IV

Data Analysis

Introduction

This chapter seeks to answer the question that promoted the implementation of this study. Throughout this chapter, I examine the data collected during the study and work towards identifying any effects music may have had on the students who participated within this study. The data sources that I will examine are teacher interviews, student interviews, student surveys, teacher/researcher journal, input from student's parents and video recordings of the students using music to enhance their comprehension of the material. This chapter is divided into three sections, each one examining a different area in which music could have promoted change or made a difference. The sections found in this chapter are cooperative learning, student comprehension, and a musical learning community.

Cooperative Learning

In order to incorporate project-based learning within my students' educational experiences, the students were provided with a science project. This project required the students to work together in a group to create a poster demonstrating the knowledge they have acquired about matter and to create their own song about matter which will showcased in a music video. In order to ensure equal participation from each student within the group, a list of five job titles, with a description of each job, was reviewed with the students. The jobs created for this project were director, choreographer, peacemaker,

graphic designer and lyricist. The students were provided with the choice to pick which job they would like to hold while working on this project. Once the students understood what the expectations were for this project, they broke up into their groups.

After examining video recordings of the groups working collaboratively and looking over the notes taken in my teacher/researcher journal, I noticed this project promoted positive and cooperative collaboration among the students. One of the video recordings displays the students working together, in their groups, on their posters. The students did not ask for help from the teachers during this activity. They solely relied on the creativity and knowledge of the material their group members possessed in order to create posters filled with factual information and descriptive drawings. While listening to the tape I heard students having meaningful discussions concerning the project. One of the students reminded her group of their ideas by stating, “Remember, we are going to have the song in the middle, so we can’t draw there” (March 30, 2009: Teacher/Researcher Journal). While another student made a suggestion, “Maybe we can sign our names on the front of the poster!” The students exclaimed, “Oh yeah let’s do that. We’ll write them in pencil first and then go over them in marker” (March 30, 2009: Teacher/Researcher Journal). In another group, I heard a student compliment his fellow group member as he stated, “Wow, nice atoms” referring to the atoms he drew on the poster (March 30, 2009: Teacher/Researcher Journal).

The other videos demonstrated the students collaborating on the execution of their song and dance for the final recording of their music video. All three groups were provided time to practice their songs within the classroom. Each of the groups gathered in a separate location in the classroom and began their work. They showed a sense of

anticipation each day we scheduled time for them to practice their songs. Even though each group was practicing at the same time, and the noise levels in the classroom did increase, the students consistently focused on their own songs, not allowing the other groups to distract them. After watching and listening to the video recordings I heard a lot of accountable talk taking place among the students. The students in each group became a family, and they made sure they were supporting one another's ideas and helping one another. I heard students say "How about we try this move?", or "Wait that is the second verse, these are the words we need to sing...", or "I really like that idea, we should use that in our dance" (April 8, 2009: Teacher/Researcher Journal). I also heard one group reviewing one of their dance moves. One of the girls in the group was explaining the move so to ensure that all of her group members understood what they needed to do. Even though each of the students had separate job titles within their group, they all played an equal part in the production of each aspect of this project. It was difficult, as an observer, to identify the position each child held because all of the students participated equally in the creation of their music video. The purpose of the separate jobs was to demonstrate to the students that each person has to participate in this project, and they are each accountable for their job and their group's final product. The students seemed to understand this idea and worked cooperatively together throughout the project.

Ultimately, I believe the concept of project-based learning worked successfully within this classroom. This type of learning provides student with choice, something the students seemed to really enjoy. When I was interviewing the students at the end of this study one of the students stated, "I really liked that we were able to choose what song we wanted to use" (May 5, 2009: Teacher/Researcher journal). Another student responded

stating, “I like that we were able to choose our own jobs and create our own dance moves to go along with the song. That really helped me” (May 6, 2009: Teacher/Researcher Journal). This idea of choice allowed all of the students to contribute their ideas, even those students who are typically shy during class time. I feel this style of learning also allowed the students to gain confidence and take pride in their work. They made sure they practiced their songs when they were given the time to do so. Some of the students even practiced at home with their parents in order to ensure that they knew their song and dance. One of the parents said to me, “She has been practicing this song for the past week, every day after school. I know the song and dance so well that I wanted to go up there and perform with her, but she wouldn’t let me when I asked her” (April 17, 2009: Teacher/Researcher Journal). The students were proud of their work because it was something they created themselves. Their pride came through when they were asked to perform for their parents, as well as for other classes that came in to watch their performances. They would become nervous for these performances, making comments such as “I am nervous” or “I hope I don’t forget the words or the dance.” But once they were in front of the audience, their confidence and pride allowed them to perform their songs successfully.

Finally, project-based learning promoted the idea of collaboration. It is imperative that students understand the importance of being able to work with others successfully. This project helped the students learn and experience the aspects of working collaboratively in a group, such as communication, respect, teamwork and equality. Project-based learning also helped these students take pride in their work

because they were provided with choices and given the opportunity to partake in their own learning process.

Along with the music videos, I implemented a few other, smaller projects in order to reinforce the information the students were taught within the lesson. These projects allowed the students to work individually. During one of the projects the students were to write their names in Braille, using different colored jewels, while in another one they were allowed to choose a polygon and create it on construction paper using Popsicle sticks. The students enjoyed these activities because not only were they learning but they were having fun. When interviewing one of the students he stated, "It's like half fun and half learning. I like it" (May 4, 2009: Teacher/Researcher journal). Again these projects provided the students with a sense of choice along with the opportunity to take part in their learning process. When they saw their projects hanging up they became excited because they were extremely proud of their work. One student exclaimed "That one is mine" to her friend, when they were walking by the bulletin board on their way to recess (March 16, 2009: Teacher/Researcher Journal). Project-based learning provided these students with many opportunities to learn and succeed.

Student Comprehension

Student comprehension was a major component of this study because as the researcher I wanted to witness whether or not music is an effective tool that can be used when teaching content to students. This data was collected through teacher observation, student interviews, and student performance on class work and quizzes. I wanted to examine if and how students used songs when performing tasks that incorporated the skills taught within the song and if it made a difference.

Assisting Comprehension within Mathematics

The first song taught to the students was the “8s Song”, which is sung to the tune “She’ll Be Comin’ Around the Mountain!” This song was taught in mathematics because the students were beginning to learn multiples of eight. The students quickly caught on to this song, but the main question became, will this help them in their pursuit of mastering their eight times table? While helping students with class work, I would make sure to point out any tricks we had learned in order to help them figure out the problem they were stuck on. When it came to any problems with an eight in it, I consistently reminded them to use this song. At times, I seemed to focus my energy on three students in our class who had IEPs. These students struggle with their multiplication facts at times and I wanted to examine if the song helped them when multiplying. One of these students is a boy and he struggles tremendously with multiplication. When working with him one-on-one I would remind him to use the song. One time he stated, “Oh yeh, that’s right, I keep on forgetting that I can use that” (March 17, 2009: Teacher/Researcher Journal). He sang the song and quickly came up with the answer to the problem. Other times after that, I noticed that he quickly referred to the song anytime he came across a multiplication sentence that required him to find a multiple of eight. When I interviewed this student, I asked him if these songs helped him remember the information, especially when he had to remember it for a test or quiz. He stated, “The eights song really helped me. Anytime I had a problem with an eight it always helped me, I would just sing the song in my head” (May 4, 2009: Teacher/Researcher Journal). The other two students with IEPs that I examined closely both made a similar comment when answering that same question. They both said they would sing the song in their head and it would help

them figure out the answer to the math problem. After looking at these three students scores on the quiz given on the eight times table, I noticed they all received a 100, in fact thirteen out of the fifteen students received a perfect score, while the other two students received a 90. Other than using it on class work and quizzes, I noticed one student used the song on her homework. There was a question on the homework that asked the students to explain another way to find the answer to 8×6 . The student wrote “You can multiply 8×7 and 8×1 and add them together or you can use the eights song to figure out the answer as well” (March 18, 2009: Teacher/Researcher Journal). Another student stated in her interview that the eights song was like a dance to her. “Yeh you memorize the song like a dance. When I am stuck on a problem I just think of the song, just like when I am stuck on a dance I think of the song and think of what move fits in that part” (May 5, 2009 Teacher/Researcher Journal). This documentation demonstrates that these students relied on this song to help them with their multiplication facts. This song not only assisted them in their endeavors, but helped them master the eight times table.

Another topic taught to the students in mathematics was gallons, quarts, pints and cups. The students had to learn how many quarts were in a gallon, how many pints were in a gallon and how many cups were in a gallon. In order to reinforce these concepts after the lesson, the students did a project and learned a song. They created what is called “Mr. Gallon.” The body parts of “Mr. Gallon” represent the amount of cups, pints and quarts are in a gallon. The “Mr. Gallon Song”, which is sung to the tune of “Sally the Camel”, is a simple tune but reinforces these concepts. I noted in my journal that it was difficult to collect data on this concept because along with this simple information, they also learned how many cups were in a pint and quart, and how many pints were in a

quart. The song and project did not deal with these concepts (March 23, 2009 Teacher/Researcher Journal). The students did struggle with these higher-order thinking questions, because they could not remember the correct amounts. I did note though that when it came to the basics, those concepts taught through the song and the project, the students had an exceptional understanding. These questions were simpler for them because they had those two experiences in which they made connections with (March 24, 2009: Teacher/Researcher Journal). When interviewing the students, a few of them mentioned that the gallon song really helped them remember this information. "I never knew how many cups, pints or quarts were in a gallon but this song really helped, especially because I knew the tune already" (May 4, 2009: Teacher/Researcher Journal).

Student Comprehension Examined Through Musical Project-Based Learning

Finally, I examined the effects on student comprehension through the use of music and project-based learning in science. Before the material was exposed to the students, they were given a ten question pre-test. The data showed that five students got five questions wrong, five students got four questions wrong, three students got three questions wrong and two students got two questions wrong. More than half of the students would have received a 60% or lower on this quiz. I began my examination on student comprehension once the students were exposed to the material, educational songs and the project they would be creating. My assessment of the student's comprehension involved verbal questioning during the time set aside for science as well as during student interviews. Not one student struggled with the questions I asked them about matter. I asked the students what helped them understand the material so well. A student responded, "We created our own song and sang it almost every day for the past few

weeks. This helped me remember the information. Plus all the experiments we did were fun too and that helped” (May 1, 2009: Teacher/Researcher Journal). A female student stated “I never knew about melting point and freezing point and the songs really helped me remember what they were” (May 1, 2009: Teacher/Researcher Journal). Another female student said, “The song helped me remember that condensation is a gas to a liquid. Also that matter is everything” (May 4, 2009: Teacher/Research Journal). Even when teachers or parents asked students questions about the material, they were able to provide the appropriate answer. At one point, one student told me he didn’t even need to go back to the song because it helped him permanently remember the information (April 12, 2009: Teacher/Researcher Journal). These students found success with these educational tunes. On my return to the classroom a few weeks later, the students still remembered these songs when I asked them about them. I even asked them questions about the material and again, they answered the questions without hesitation, getting each one correct (May22, 2009: Teacher Researcher Journal). I was also approached by a parent on the day they were invited to watch the students perform. This parent stated, “They will always take this with them. When I was younger I did the same type of thing and I still remember it to this day. I think this was such a great idea. They will always remember this information and the experience” (April 17, 2009: Teacher/Researcher Journal).

This data has demonstrated that music and project-based learning play a role in student comprehension of the material. The students provided their first-hand experience with these styles of learning stating that they simply would go back to the songs if they

needed help answering a question. The repetition helped them remember the facts easily and perform effectively on assessments.

Musical Learning Community

When examining the data collected during this study I wanted to take a look at the effects music and project-based learning may have had on the learning community within the classroom. I noticed, after watching videos and reading over my notes, that when it came time for “musical matter” on our daily schedule, all differences were set aside. The students were enthralled with their project and the music. There was less controversy among the students and more positive communication. During one of our practice sessions I heard a group discussing one of their dance moves for their dance. They needed to decide upon what movement they wanted to make in order to represent a solid (one of the states of matter). The discussion went as such:

“We have two different moves representing a solid and I am going to get confused. I like both, but do you think that we can pick one to make it easier?”

“Yeh, I agree. I am already confused. I guess we should pick one that we like better. Let’s vote.”

The group reviewed their options and then had a simple vote. They came upon an agreement and the problem was solved (April 1, 2009: Teacher Researcher Journal). The students were civil with one another, acknowledging each other’s ideas and listening to each other’s ideas. Along with examining how the students treated one another in their separate groups, I looked at how the separate groups treated one another during practice and their performances.

“Ms. Frevert, may I help you turn the page? I know all the words for the Celebrators song and I know when to turn the page” (April 15, 2009 Teacher/Researcher Journal). I was also asked “May we sing along with each group’s song? We know all of the words and it will be so much fun” (April 14, 2009 Teacher/Researcher Journal). Comments such as these were consistently made by my students when the students were provided with time to practice their song in front of their peers. The comments such as these, along with other data from video recordings and the teacher/researcher journal demonstrated positive interactions among the three groups within the class. Each group knew the other two groups song by heart. The week of the student’s performance for their parents, we had the students practice a little every day. Each group was provided the opportunity to practice in front of their classmates. During this time, when a group was performing, the other students were completely quiet. I noticed that most of them were even singing along with the song quietly to themselves, or were dancing along with the beat. All of the students consistently supported one another. On the tapes I can hear the students burst into applause after each group performed their song. During snack one day I recorded in my journal that the students proceeded to sing each of the three songs created by the groups. Two or three students quietly begin singing “Matter, matter, matter, here is a song that teaches you about matter...” Once these students began singing, the entire class chimed in finishing up the entire tune. They then sang the songs of the other two groups. I wrote in my journal “it is incredible to witness the bonds these students have created among one another, due to a simple project that incorporated music. Each student knows every word to every song and they have truly become a family. This one experience has brought them closer together and will give them

something they can remember forever” (April 23, 2009 Teacher/Researcher Journal).

When interviewing the students I asked them to name a few of their favorite songs that they learned during this study. Most of the students named a song that another group had created. The students seemed to become in tune with one another, promoting a supportive, productive and unified learning community. Although, it seemed the data supported the idea that music assisted in creating a positive learning community within the classroom, I wanted to examine the data and see if it had an effect on the school learning community.

School Learning Community

“What a fantastic job all of you have done! This is such a great idea, having them create songs incorporating facts they have learned about matter. We might have to borrow these songs in first grade because we are learning about matter now too” (April 20, 2009: Teacher/Researcher Journal). This was a comment made by a first grade teacher whose class was invited to our classroom to watch our students perform their songs about matter. Many of the teachers within the school had heard about the project our students were doing and were interested in the outcome and the success of our students. This project did not remain in the confines of the classroom learning community, but spread throughout the school community. On April 20, 2009, we sent an open invitation to the classes within the school, inviting them to our class to watch and listen to the students’ songs. On that day eight classes came in to watch the students perform. Many of the teachers made comments such as the one above. On that day I recorded a second grade teacher’s comment as “I can’t believe they were able to create all of this on their own. By allowing them to work with the information like this, they

will remember it forever” (April 20, 2009 Teacher/Researcher Journal). Not only did I examine the teacher’s responses, but I looked at the students in the visiting classes.

I took pictures of some of the groups as they were sitting in the class listening to the children perform. All of their attention was up front, and not one student was looking away. At the conclusion of each song I noted the student’s abilities to correctly guess the songs the students chose to put their lyrics to. Every class that listened to these songs was able to identify the songs chosen. This demonstrated that they were able to maintain their focus and attention on the performers in front of the class. I even noted in my journal that a second grade female student, diagnosed with autism, was very cooperative during the students’ performances. She even began singing along with the students and mimicking their dance moves. At the end of each performance, she cheered loudly, along with the rest of her peers. These performances even promoted a discussion among the fifth grade class that came in to watch our students. When talking with the teacher of that classroom, she told me that her students began thinking of other songs the students could have used in order to create their matter songs. They began singing their ideas to the rest of the class. She noted how the music excited her class and she feels it’s a tool she would like to use in the future because she saw the positive influence it had on her students’ creativity (April 21, 2009: Teacher/Researcher Journal). Another incident noted in the teacher/researcher journal was a cooperative learning experience the students had with a first grade class that came to watch our students perform. After watching our students, the teacher suggested her students teach our class one of the songs that they learned. After they sang a song, our class sang a math song they had learned. This allowed each class to share its experience with music, providing each with different songs they can use

in the future to reinforce the material. As word spread of the students' performances around the school, the kindergarten teachers asked our class to perform for their students. They were teaching a unit about how different people express themselves, and they wanted our students to be models, demonstrating how they express themselves through music. This experience with music seemed to unite the school, promoting a sense of collaboration and support. The music allowed the school to come together, demonstrating to the entire student body the importance of working together as a whole. The use of music also incited new ideas for teachers to use during their instruction and provoked the creativity among the students who came to watch the performances. This sense of community even seemed to infiltrate itself beyond the school walls, entering the homes of the students exposed to this experience.

The Learning Community: Extending Beyond School Grounds

The parents of the students were invited to come and watch their children perform. Out of the sixteen students in our class, thirteen of the students had a parent/guardian come in to watch them perform. As the teacher/researcher I was stunned with the amount of parents who came in to watch their children. On this day, April 17, 2009 I wrote "I am overwhelmed with joy due to the outpour of support from these parents. This learning community has spread beyond the walls of this classroom, and has allowed friends and family to partake in our success" (Teacher/Researcher Journal). Examining the parents during the performance, I noticed a sense of pride and amazement come over some of them. At the end of the performances they asked questions such as "How did you think of what song you were going to do?", "How did you create those dance moves?", "How did you remember the whole routine?" They seemed to realize the

level of excellence at which their children performed. Although these parents seemed to be pleased with their children's triumphs, it was the comments made at the end of the performance that lead me to believe this project went beyond that of the classroom and school. A parent came up to me and stated:

“Not only was this project interactive, educational and motivational, but it provided me with the opportunity to work with my daughter. Every day, this past week, after school she practiced her song. I was able to help her by practicing with her or by being her audience and guide her by telling her things she needs to work on. I always help her with her homework, but this really allowed us to work together and have fun. Not only did she enjoy it, but I could tell she learned a lot” (April 17, 2009:

Teacher/Researcher Journal).

Another parent, who has a daughter in the class and another younger daughter in preschool, explained how her daughter taught her younger daughter these songs. “My younger daughter now knows the song and dance for her sister's entire song and that's all the two of them sing. She also tried to teach her what everything means in the song. So she will be set when she is in kindergarten, she will amaze the teachers with her knowledge about matter” (April 17, 2009: Teacher/Researcher Journal). Finally, another parent stated how this project reminded her of something similar she had to do in school and she was able to share this with her daughter. This mother and daughter were able to create a bond through their experiences with music.

The comments and support demonstrated by these parents identify the influence music and project-based learning have had on the entire learning community. Every

aspect of the community was involved with this project, and it provided each individual the opportunity to express themselves. Parents were able to share prior experiences with their children, peers were able to collaborate or hold discussions of how they would have created their songs, and our students were able to express themselves through music, which identified them as role models for younger students.

Conclusion

After examining the data collected during this study, most of it identifies project-based learning and music as tools that can successfully be incorporated within the classroom curriculum. Each of these techniques improved student comprehension, student collaboration, and promoted an energetic, fulfilling learning community. In the chapter to follow, the answers collected from this data will be discussed. A summary of the data will be presented followed by an in-depth discussion of the conclusions drawn from the study. Finally, implications of the study will be presented, allowing educators and administrators to see the benefits these techniques can have within the classroom.

Chapter V

Conclusion, Limitations and Implications of the Study

Summary

This study was conducted in order to examine the use of music and project-based learning as educational tools within the classroom. The findings of this study suggest that music and project-based learning ultimately had a positive impact on student instruction, comprehension and the learning environment. The students seemed more excited to learn. They looked forward to the scheduled time of the day when they could work on their projects and their songs. Music and project-based learning also seemed to help improve the students' retention of the material. For example, they were able to answer a question about matter, multiples of eight or about Mr. Gallon without hesitation, because they could make connections with a song or a project associated with those concepts. The study's findings suggest that concepts became firmly embedded within their memory and were easier to recall because of the prominent association they had with the material. Providing the students with choice also seemed to motivate them to want to learn and inspired them to reach beyond the limits they had set for themselves.

Conclusions

Within this section, I will discuss conclusions I reached after examining the overall effect of music and project-based learning within the classroom. In chapter two I referenced Petress who stated that project-based learning makes learning more enjoyable, motivational and effective. It boosts students' egos instead of frustration levels, and

stimulates a sense of pride and confidence within the students (2008). The students are proud to show others the projects they created on their own, using their own knowledge and skills. Along with creating a positive sense of self, Grant found that project-based learning enables students to show their interests, abilities, diversity and their learning styles (2002). The students tend to succeed exponentially on these projects because they are using the intelligences that are most beneficial to them, just as they use those intelligences on normal daily projects (Wolk, 2006). Wolk also suggests that along with assisting in constructing meaning of the material, project-based learning creates a true learning community. He stated, "When the work is really flowing, there is a certain ethos in the air; the children are working so intently, so genuinely, and they are constantly interacting and collaborating with one another" (2006, p. 1). I believe that the current study effectively demonstrated these ideals. The students were successful because they were given the opportunity to be in charge of how they constructed meaning of the material. They were excited to see matter on the schedule and could not wait to work in their groups on their songs. While working in their groups, each of the members worked cooperatively and contributed equally to the production of their music video. They understood that this project was their creation and I was only there to watch over their progress. It took time, but they began to rely on one another to answer questions and solve problems. In the end, they were proud to show off what they had created because they had done it all on their own. An example of this pride was referenced in chapter four. A student was excited to point out her math project that she had created and was hanging in the hallway. She made sure to point it out to her friend as they walked by it on their way to recess. Another example of this pride was demonstrated when the

students stated to me that they were nervous but excited to perform their songs for their parents. “I’m really excited Ms. Frevert because I like our song, but I think I’m nervous because I don’t want to mess up anything” (April 17, 2009; Teacher/Researcher Journal).

Additional studies demonstrate an increase in student comprehension due to project-based learning. One, in particular, described Brooklyn’s New York Harbor School which implements a maritime curriculum whereby, students work with Newton Creek, in New York. This school was created in order to give urban students, especially those from poor minority communities, and failing schools, access to water. The statistics, from this study, demonstrated that originally 90% of the students entered the school below grade level in reading and math; however after completing this school’s maritime curriculum 79% of the students passed math A and nearly that same amount aced living-environment science, global history, and geography (Schibsted, 2006). These students were not expected to succeed academically, due to their low scores on assessments. The new scores acquired by the students after they experienced a project-based learning curriculum, allowed Fisher to anticipate that “up to four-fifths of Harbor’s senior class will graduate in 2007”, a feat not expected to be reached by these students (Schibsted, 2006, p. 28).

The findings of this current study, involving music and project-based learning, suggest that projects contributed to students’ in-depth understanding of the material. A few of them even mentioned, during interviews, that creating the songs helped them learn and remember facts about matter, such as condensation and the melting point. The project helped them because they were consistently working with the same material and it was being reinforced over a period of time. Other projects constructed within the class

seemed to reinforce further understanding of the concept that was taught. Mr. Gallon visually demonstrated to them all the parts that make up a gallon, and the polygon project allowed them create their own polygon instead of just continually identifying the one-dimensional figures in the text book. Their ability to comprehend this material soared after they physically worked with the material, and constructed their own meaning of the new concepts that were taught.

When examining the effect of music on student comprehension, I referred back to chapter two and the research on the role music plays on a person's memory. Jensen (2000) stated that while listening to music, the brain is actively engaged in prediction, analysis, sequencing and encoding, forcing the brain to pay attention to auditory input. As a person is focusing on the elements of the music playing, the music is also evoking multiple memory pathways, strengthening these systems for explicit (conscious) and implicit (unconscious) memory (Jensen, 2000). Music allows memory to be stored in multiple pathways, increasing the likelihood of retrieval. I noticed this association with memory and retrieval of information, especially with the 8s song. The students were struggling greatly with their multiplication facts, specifically as the multiples increased. They did not learn any tricks to remember the multiples of eight, so it was difficult to memorize them. Once I introduced this song to them, I could see relief come over their faces. They finally had something to help them with their multiples of eight. Within days, these students were whizzing through any multiplication sentences that required them to multiply by eight. I could see and hear them singing the song and using their fingers to keep track on. I also know that these songs helped the students because they expressed it to me while interviewing them. One of the students stated, "The eights song

really helped me. Anytime I had a problem with an eight it always helped me, I would just sing the song in my head” (May 4, 2009: Teacher/Researcher Journal). The students also agreed that their matter songs helped them remember the information better. I noticed this when I randomly asked students questions during down time. They did not have to take much time to think about the answer, they were able to retrieve the information easily and provide me with the correct answer. The music provided the students with a quick retrieval process with which to access the information they had learned from lessons and the song they created.

Limitations of the Study

A major limitation of this study was time. I was provided the time to conduct the study, but the school day did not provide me with essential time necessary to reinforce this use of music. New topics were quickly presented to the students, and it was rare if the instruction for these topics lasted for more than two days. This hindered my ability to reinforce any songs taught on a specific topic, because the next day we had to move on to new material. I felt it would be defeating to sing a song that does not go along with the material. This may confuse students and would not prepare them for the new material they would be learning.

This lack of time influenced the amount of data I was able to collect during the study. Due to the simple fact that I was not able to reinforce the songs on a daily basis, I was not able to witness their effects on the progress of the students. I did my best to review these songs on the students’ down time, such as snack or during our morning routine. Although the students ended up knowing the songs, the effects on student achievement were challenging to measure. This idea of time is something I found to be a

problem, not only in my study, but in other classrooms as well. As I conducted interviews with other teachers about their use of music, they all noted that they would love to use music more. They agreed that it is a great tool in reinforcing new material and making it fun. But as one teacher said, “They are strict when it comes to following the curriculum. We have to accomplish everything that has been planned for the school year. This often cuts any time for music in the classroom because we need to keep up with the pace of the curriculum.” (April 30, 2009: Teacher/Researcher Journal). I found constraints of covering curriculum content to be a common thread among many teachers; they are not given enough time to make learning as fun as it should be. As the teacher, I created the time to incorporate music within the classroom but the problem lay in reinforcing the music, so that it would be beneficial for the students.

Implications of the Study

This study highlights significant strategies that educators may use within their classroom in order to educate their students. I understand that the curriculum needs to be followed and material needs to be taught in a timely manner. But using music and projects can accentuate the curriculum and are not meant to supplant or diminish instruction. Projects and music may be incorporated within class instruction, as shown in this study. I taught my songs during the lesson, after I reviewed the material with the students. Project time was provided at the end of the day, once we completed everything that was planned for the day. Although this may require teachers to spend a little more time planning lessons, it benefits the children greatly. They are excited to learn and look forward to instruction time. These tools provide students the ability to learn in a manner that is most beneficial to them. Further, students seem to gain a fuller comprehension of

new concepts; they understand the material better and their retrieval of the information is quicker and more accurate.

I believe it would be beneficial for administrators to allow teachers to implement this type of curriculum within their classrooms. This study discusses the success that this type of curriculum had in a particular classroom. Music and projects positively affected student comprehension, the learning community and student interactions. I believe that the material does need to be supplemented in another matter, alongside project-based learning, but I feel this is an important tool that is not taken advantage of as often as it should be. Music is also simply seen as a special, when this study proves that it serves multiple purposes. Supplementing material with music provided students with a quicker and simpler way to store and retrieve information. They were proud when they could answer questions correctly without having to look it up in their books. These styles of learning would be beneficial in most schools and should be looked upon in a positive light. Project-based learning and music employ higher-order thinking skills and increase memory. Not only will this help students with their future endeavors, but they will ultimately improve the test scores that have become so critical in today's world.

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APPENDICES

APPENDIX A

Educational Songs

Mr. Gallon Song
(Sung to “Sally the Camel”)

4 Quarts equal a Gallon
4 Quarts equal a Gallon
4 Quarts equal a Gallon
So Roll Baby Roll (Book, Boom, Boom)

8 Pints equal a Gallon
8 Pints equal a Gallon
8 Pints equal a Gallon
So Roll Baby Roll (Book, Boom, Boom)

16 Cups equal a Gallon
16 Cups equal a Gallon
16 Cups equal a Gallon
So Roll Baby Roll (Book, Boom, Boom)

EIGHTS
(Sung to She’ll be Comin’ ‘round the Mountain)

8, 16, 24, 32,
40!
48, 56, 64,
72!

48, 56,
64, 72,
She’ll be countin’
‘round the mountain
when she comes...
80!

Angles Song
(B-I-N-G-O)

There was an angle had a name and righty was his name Oh
Square Corner, just like so
Square corner, just like so
Square corner, just like so
And Righty was his name Oh!

There was an angle had a name and Acute was her name Oh
Closed and cute, just like so
Closed and cute, just like so
Closed and cute, just like so
And Acute was her name Oh!

There was an angle had a name and Obtuse was his name Oh
Open wide, just like so
Open wide, just like so
Open wide, just like so
And Obtuse was his name Oh!

QUADRILATERAL DANCE
(Sung to "Father Abraham")

Quadrilateral has many shapes
Many shapes are quadrilateral
A square is one of them
Congruent sides
And 4 right angles too

Right arm

Quadrilateral has many shapes
Many shapes are quadrilateral
A parallelogram, opposite sides
Both sets are parallel

Right arm, left arm

Quadrilateral has many shapes
Many shapes are quadrilateral
Rectangle's one of them
The corners square
4 right angles around

Right arm, left arm, right leg

Chorus

Quadrilateral has many shapes
Many shapes are quadrilateral
A trapezoid is one, 2 parallel
But the other 2 are not

Right arm, left arm, right leg, left leg
Quadrilateral has many shapes
Many shapes are quadrilateral
Rhombus could be a square
Or diamond too
Must have congruent sides
Right arm, left arm, right leg, left leg

FOUR SIDES!

Writing a Friendly Letter Song
(Sung to "Mulberry Bush")

First you write the date, date,
First you write the date
The month, the day, the year

Then you write the greeting, greeting, greeting
Then you write the greeting
You start it off with Dear

Then you write the body, body, body
Then you write the body
You ask and tell some things

Then you write the closing, closing, closing
Then you write the closing
Your Friend or Sincerely

Under that you write your name, write your name, write your name
Under that you write your name
And then your letter's done

Atom Song
(Sung to "The Adam's Family")

They are so small (snap, snap)
They're round like a ball (snap, snap)
They make up the air
They're everywhere
Can't see them at all

Before we even start
There are some basic parts
The three particles
And the nucleus

They are so small (snap, snap)
They're round like a ball (snap, snap)
They make up the air
They're everywhere
Can't see them at all

There're positive protons
And neutral neutrons
They form the nucleus
The center of an atom

They are so small (snap, snap)
They're round like a ball (snap, snap)
They make up the air
They're everywhere
Can't see them at all

The last particle
Is called the electron
It's negatively charged
And travels at high speeds

They are so small (snap, snap)
They're round like a ball (snap, snap)
They make up the air
They're everywhere
Can't see them at all

Solid, Liquid and Gas
(Sing along at Teacher Scholastic.com)

Everything around us
Is made of Matter
Solid, liquid, or gas
Matter can move from
One state to another
Sometimes really fast

Solid, liquid and gas you see
Are states of matter changed by heat
Melting, boiling and freezing points
Heat moves molecules where it wants

Ice is a solid
And then a liquid
When temperatures increase
The heat keeps rising
Before you know it
It disappears into steam

Chorus

Water is a liquid
That turns to a vapor
When exposed to heat
Add freezing temperatures
You'll see a solid
As ice appears on the scene

Chorus

Vapor is a gas
That turns to a solid
When cooled to extremes
If the mercury keeps falling
The liquids gonna
Form ice suddenly

Chorus x2

APPENDIX B

Student Songs

Celebrate Matter
(Sung to “Celebration”)

Celebrate Matter c’mon!
Solid, liquid, and gas

There’s a party of matter right here
Three states of matter solid, liquid and gas
So bring your soda and your popcorn too
We’re gonna sing a song about matter for you
Condensation
When a gas becomes a liquid
Evaporation
Let’s have the water become a gas

It’s time to become a solid
It’s up to the temp. to become freezing
Everyone around the world is matter!

Celebrate Matter c’mon!
Solid, liquid, and gas

Freezing, melting and boiling point
Heat is what makes them change

Let’s melt that solid into a liquid
And have a drink, it’s alright

Let’s heat that water, into a gas
And have some pasta, it’s alright

The molecules that make up matter,
Are called...Atoms!

Celebrate Matter c’mon!
Solid, liquid, and gas!

Matter
(Sung to “Scooby Doo”)

Matter, matter, matter, here is a song that teaches you about matter.
Matter is anything that takes up space and has mass.
The freezing point is when a liquid becomes a solid.
Condensation is when a gas turns into a liquid.

The three states of matter are solid, liquid and gas.
The boiling point is when a liquid becomes a gas.

Matter, matter, matter, here is a song that teaches you about matter.
The melting point is when a solid becomes a liquid.

We Are Matter
(Sung to “We Are Family”)

We are Matter
Solid, Liquid and Gas
We are Matter
Melting, Boiling, Freezing Point

The molecules in a solid are packed tightly together
The molecules in a liquid are further apart
The molecules in gas are spread far apart
Just let us state for the record...
These are the 3 states of Matter

We are Matter
Solid, Liquid and Gas
We are Matter
Melting, Boiling Freezing Point

The molecules that make up matter are called Atoms
Physical changes occur when matter changes appearance
Chemical changes occur when matter completely changes

We are Matter
Melting, Boiling, Freezing Point

Matter Rules!

APPENDIX C

Matter Project Guidelines

Group Responsibilities

Lyricist: The lyricist works with the rest of the group in creating the lyrics to their song. He/she writes the lyrics to the song the group creates and types them up for the group. The song must follow along with the tune picked by the whole group.

Graphic Designer: The job of the graphic designer is to lead the group in creating a poster for the music video, which demonstrates information about the group's topic. The poster may display the lyrics to the song but it is not a requirement. The poster must demonstrate what the group has learned about the topic they have been assigned. Everybody must help writing on and coloring the poster.

Choreographer: The choreographer works on creating what the group should do during the video. He/ she will work with all the group members in creating a dance or skit.

Director: The director oversees the production of the music video. He/she reviews everybody's parts, making sure everybody understands what they are doing. The director is not in charge of the group during the project. Everybody has an equal say in decisions that are made within the group.

Peacemaker: This student is in charge of resolving group conflicts. If students are struggling with a problem, they will go to the peacemaker and he/she will try and work out the issue.

Matter Fact Sheet

Matter is anything that takes up space and has mass.

The 3 states of matter are solid, liquid and gas.

The molecules in a solid are packed tightly together and jiggle in place.

The molecules in a liquid are further apart and easily flow past one another.

The molecules in a gas are very far apart and move the fastest.

The tiny molecules that make up matter are called atoms. Atoms have a nucleus and three other particles. The protons (positively charged) and neutrons are found in the nucleus. The electrons (negatively charged), are found moving around the nucleus.

Physical changes occur when matter changes the way it looks and does not become a new substance.

Examples of Physical Changes:

Boiling Point: When a liquid becomes a gas

Melting Point: When a solid becomes a liquid

Freezing Point: When a liquid becomes a solid

Condensation: When gas turns into liquid

A Chemical Change is when one kind of matter changes into a different kind of matter.

Examples of Chemical Changes:

Baking Soda and Vinegar

Vinegar and Milk

Baking Soda and Lemon Juice

Music Video Rubric

Project Elements	Exceeds	Meets	Almost Meets
Group Work	<ul style="list-style-type: none"> • Group worked cooperatively together • Group members resolved conflicts on their own • Group members listened and accepted each other's ideas 	<ul style="list-style-type: none"> • Group worked cooperatively • Group members resolved conflicts in a timely manner • Group members listened and accepted most of each other's ideas 	<ul style="list-style-type: none"> • Group members had difficulty working cooperatively • Group needed support in resolving conflicts • Not all member's ideas were accepted
Content	<ul style="list-style-type: none"> • Group used most facts effectively and clearly within the song they constructed 	<ul style="list-style-type: none"> • Group used facts in their song effectively and clearly 	<ul style="list-style-type: none"> • Group used few facts in their song and needed assistance in presenting the information in a clear, concise manner
Poster	<ul style="list-style-type: none"> • Poster displayed appropriate facts clearly • The poster was neat and colorful • The poster enhanced the music video 	<ul style="list-style-type: none"> • Poster displayed facts • Poster was neat • The poster went along with the video 	<ul style="list-style-type: none"> • Poster displayed few facts • Members needed support in making the poster neat • The poster did not help support the group's video
Song	<ul style="list-style-type: none"> • Song was easy to follow along with and well organized • The song had the required 3 verses and a chorus • The song is sung to a catchy tune 	<ul style="list-style-type: none"> • Song was easy to follow along with • The song had 2 verses and a chorus • The song is sung to a catchy tune 	<ul style="list-style-type: none"> • Members needed support in creating a song that was easy to follow • Members needed support in creating a song with an appropriate length • Members needed assistance in picking a tune