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**Technology-Rich Project-Based Learning and the
Comprehension of Music Theory**

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Submitted in partial fulfillment
of the requirements for the degree of
Master of Education
Moravian College
Bethlehem, Pennsylvania
2011

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ABSTRACT

This qualitative research study examined the effects on students' comprehension of music theory, when project-based learning and technology were implemented in an eighth grade general music class. Nineteen students participated in the seven-week study. The project required students to create lyrics in AB form, compose an original rhythm and melody based upon the lyrics, perform and record the composition, create an accompaniment for the song, and film and edit a music video. The technology required to complete the project included: Finale Note Pad, midi files, GarageBand, Flip Cameras, iPhoto, and iMovie. Throughout the process, the teacher's responsibilities included: planning and implementing the project; whole class, small group, and individual instruction; conferencing with group; monitoring student progress; and assisting with technology implementation. Finally, student progress was monitored through the use of exit slips, rubrics, a survey, and a comparison of a pre-test and post-test given.

As a result of the study, it was determined that traditional instruction is needed prior to the implementation of project-based learning, in order to provide students with a foundational understanding of the necessary concepts needed to work through and complete the project. Also, the use of technologies such as Finale Note Pad, Garageband, iPhoto, flip cameras, and iMovie motivates most students to remain on task, complete assignments, and have a positive attitude

towards learning. Finally, it was determined that while project based-learning in a general music classroom might improve student understanding of music theory based upon pre-test and post-test data, student performance ability showed no comparable gains.

ACKNOWLEDGEMENTS

At this time, I would like to thank many individuals who have contributed to the successful completion of my action research study. First, I would like to thank my students whose participation was vital to the study. Their honesty, patience, determination, and hard work allowed me to gain a better understanding of the impact project-based learning had on student comprehension of music theory in the general music classroom.

Second, I would like to thank my Principal, Suzanne Vincent who allowed me to conduct my action research study and my Assistant Principal, Rodd Luckenbill who contributed to the design of the original project. Suzanne and Rodd were always supportive of this project and were very supportive of me as I conducted the action research study and wrote my thesis.

Third, I would like to thank Dr. Shosh, Dr. Grove, as well as the other Masters of Education faculty for all their help, encouragement, and support as I worked my way through the Masters of Education program at Moravian College. Their knowledge, instruction, and insights have been invaluable to me.

Finally, I would like to thank my family and friends whose support has allowed me to pursue my goal of obtaining a Masters Degree in Curriculum and Instruction. I know it was not always easy for my family but it is because of your encouragement that I was able to achieve my goal. Thank you!

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RESEARCHER'S STANCE

I have been a general music teacher for sixteen years, thirteen years in multiple elementary schools and three years in one middle school. I have taught in a variety of schools with a wide range of socioeconomic and ethnic diversity. However, the one thing that has remained constant is my belief that every child can learn. Not all children are able to learn the same way and as a teacher, I believe it is my responsibility to provide a variety of opportunities in my classroom so that all students can be successful.

I have always used hands-on activities as a method of instruction and have provided opportunities within each class to accommodate the oral, aural, and visual learner. I have also tried to provide opportunities that include student choice, which improves motivation and accommodates students strengths based upon their multiple intelligences. The practice of choice is one of my core beliefs. I feel that it is extremely important for students to have a choice whenever possible in order to promote individualized learning as well as foster greater understanding of content and student responsibility in his/her learning.

The concept of choice is linked with my second core belief: the importance of academic knowledge. In order for students to gain an appreciation of music, they first need to understand the complexities involved in music composition and performance. It is through choice and project-based learning

that I hope to foster a greater understanding of music theory in my students. I believe that if students are more motivated to learn then they are going to have greater academic gain. I also believe that students learn more when working collaboratively which is another component of project-based learning.

Finally, my third core belief is the importance of the “big idea,” which to me is probably the most important. I want my students to understand why music education is important and how this knowledge can be transferred beyond the classroom. To this extent, I have implemented two technology-related projects with previous elementary age students. Both of the projects were awarded first place and were given the Harford County Public Schools Curriculum Award. The first project required students to compose a survey regarding music knowledge (composers, families of instruments, etc.) that was then sent to people through an email account that I opened specifically for this project. In addition to people responding to our survey, they were asked to forward the email on to their friends. By the end of the project, we had received over 200 surveys from seven different countries as well as from all over the United States. As a class, we graphed the information as well as marked a world map to show where the people lived that had responded to our email survey. The project was effective in demonstrating to students that music education and an understanding of music theory and history is an important part of many cultures around the world.

The second project was also implemented with elementary age students. For this project students were required to work through a TechTour that I had developed in conjunction with Johns Hopkins Center for Technology and Education's Thinkport web site. This project led the students to discover the development and importance of African-American music and how it related to historical events of the time. Students were encouraged to discover new knowledge about spirituals, code songs, blues, jazz, and protest songs as well as history including but not limited to slavery, the Civil War, the Underground Railroad, Reconstruction, the Harlem Renaissance, and the Civil Rights Movement. I believe that this project was successful in demonstrating to students that music and history are related as well as helping them to gain a new understanding and appreciation for the various genres presented in the study.

Because of my beliefs as well as my use of technology in the past, I believe that my current students will benefit from the implementation of technology in a project-based learning environment. Project-based learning accommodates all students' abilities with its built-in scaffolding, student choice, and independent as well as collaborative work. I believe that technology helps to link the projects to real-world applications, thus increasing motivation and understanding of the content.

RESEARCH DESIGN AND METHODOLOGY

Purpose

The purpose of my study was to share the observed and reported experiences of and knowledge gained by eighth grade general music students and their teacher while project-based learning was implemented in the classroom. It was through my action research study that I had hoped to gain a better understanding of how project-based learning and the implementation of technology within my classroom affected student achievement. The purpose of the study was not to prove that project-based learning is the only effective method of classroom instruction. Nor was the purpose to prove that project-based learning was the only reason that students' gained content knowledge.

Setting

My action research study took place in a suburban middle school in eastern Pennsylvania. The school consisted of sixth, seventh, and eighth grades and had a population of one thousand forty-one students; three hundred sixty-four sixth grade students, three hundred fifty-two seventh grade students, and three hundred twenty-five eighth grade students. Of the one thousand forty-one students, one hundred twenty-four were learning support, fifty-three received speech and language services, thirty-seven were English Language Learners, fifty-nine were gifted, and two hundred sixty-four were economically disadvantaged. In regards to their ethnic backgrounds, sixty-two students were

Asian, fifty-six were Black, seventy-eight were Hispanic, and eighth hundred forty-five were White.

Participants

Of the twenty-one students in my second period, eighth grade general music class, nineteen students participated in the study. Ethnically, of the nineteen participants, three students were black and sixteen students were white. Academically, there was one IEP student and fourteen students had scored either proficient and/or advanced on the PSSA reading and math assessments. One student scored basic on the math assessment and one student scored basic on the reading assessment. Musically, there were three students who had played an instrument for four years, two students who had played an instrument for three years, and one student who had played an instrument for one year. In regards to participation in music ensembles, there were five students who were members of the chorus, one student who was a member of the orchestra, one student who was a member of both the orchestra and chorus, and one student who was a member of the band.

Data Collection

Pre-Tests and Post-Tests

I employed pre-tests and post-tests to determine the musical knowledge gained as a result of project-based learning. The tests were designed so that they were very similar. They contained the same number and style of questions and

the only changes made were to the actual rhythms and melodies used. Because the tests were very similar, I felt confident that a comparison in their scores provided valuable information.

Student Observation

A teacher-researcher needs to engage in prolonged data collection and that the recording of this data be done with accuracy (Hendricks, 2009). Consequently, I observed my students over a period of seven weeks and I recorded all observations in my double entry journal. I provided the setting, the participants, and the situations in great detail keeping facts separate from personal thoughts and impressions.

Exit Slips

In order to gain data throughout the study, seven different exit slips were used. Students were required to either demonstrate an understanding of content material or give their thoughts and feelings about the project. Statements and questions included the following...

1. Complete the following math problems. Add up the beat values of the notes and/or rests to determine the numerical answer.

2. Write 4 ***different measures*** in $\frac{4}{4}$ time using a combination of

○ , - , d. , d , - , d ,  ,  ,  ,  , & 

3. Describe your experiences with the online tutorials, vodcasts, web sites, games, etc. that you have been using to learn about rhythm. Discuss likes, dislikes, what needs to be improved, what should stay the same, and anything else you would like to share. Use the back of the paper if you need more room.
4. Composing a rhythm is like...
5. Discuss how your group is working. Include strengths, weaknesses, problems, etc. Please include if a teacher intervention is needed to help resolve a problem.
6. Using technology makes me feel...
7. This project makes me feel...

The exit slips provided a dual purpose. First, they gave me information about the students' understanding of content material that enabled me to plan lessons based upon the needs of the students. Second, it provided data for my study, both on content knowledge as well as opinion about the project. On slips pertaining to content knowledge as well the group dynamics, students were required to write their names because I needed to know how to help my students. However, for my study, names were removed from the exit slips and pseudonyms used. Students were not required to write their names on the remaining exit slips because I wanted the students to feel that they could give honest opinions about the use of technology and the project as a whole.

Student Work Samples

During the implementation of the project, students were required to complete three different products that were graded based upon rubrics. The first product that the students submitted was their lyrics and the rhythms they composed based upon the lyrics. The second product submitted by the students was the finished song, including lyrics, rhythm, and melody. The third and final product submitted by the groups was their music video that was also presented to the class.

Survey

A final survey was given to my students on the last day of class. The survey was designed to gather the students' opinions about the use of technology as well as the design of the project. Students were asked to consider if the technology and/or the project helped them to gain a greater understanding of music theory. Also, students were asked to consider if any of the technology helped them learn and if so, which technology helped the most. Finally, students were asked their opinions about working in groups and whether or not this helped in the learning process. By gathering this data, insight was gained into the students' views concerning technology and project-based learning implementation in the classroom.

Project Design

Topic and Summary: Students will work cooperatively to create and perform an original composition combining their knowledge of musical elements and the use of poetry for lyrics. Students will then use technology to design and create a music video to engage students in performance, production, and career possibilities in music.

Stage 1 – Desired Results

Content Standard(s):

Music (Education World: The Educator's Best Friend, 1996)

Content Standard #4: Composing and arranging music within specified guidelines

- *Achievement Standard:* Students compose short pieces within specified guidelines (e.g., a particular style, form, instrumentation, compositional technique), demonstrating how the elements of music are used to achieve unity and variety, tension and release, and balance

Content Standard #5: Reading and notating music

- *Achievement Standard:* Students use standard notation to record their musical ideas and the musical ideas of others

Content Standard #7: Evaluating music and music performances

- *Achievement Standard:* Students evaluate the quality and effectiveness of their own and others' performances, compositions, arrangements, and improvisations by applying specific criteria appropriate for the style of the music and offer constructive suggestions for improvement

Content Standard #8: Understanding relationships between music, the other arts, and disciplines outside the arts

- *Achievement Standard:* Students describe ways in which the principles and subject matter of other disciplines taught in the school are interrelated with those of music (e.g., language arts: issues to be considered in setting texts to music; mathematics: frequency ratios of intervals; sciences: the human hearing process and hazards to hearing; social studies: historical and social events and movements chronicled in or influenced by musical works)

Literacy (Pennsylvania Department of Education, 2011)

Writing-Types of Writing

1.4.8.A Write poems, short stories, and plays.

- Apply various organizational methods.
- Include **literary elements** and **devices**.

Technology (International Society for Technology in Education, 2007)

1. Creativity and Innovation

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:

- a. Apply existing knowledge to generate new ideas, products, and processes.
- b. Create original works as a means of personal or group expression.

2. Communication and Collaboration

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:

- a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environment and media.
- b. Create original works as a means of personal or group expression.

3. Technology Operations and Concepts

Students demonstrate a sound understanding of technology concepts, systems, and operations. Students:

- a. Understand and use technology systems
- b. Select and use applications effectively and productively.
- c. Troubleshoot systems and applications.
- d. Transfer current knowledge to learning of new technologies.

Understanding(s):

- Students will understand the procedures needed to compose and perform music, such as:
 - Finding/creating lyrics
 - Composing a melody with rhythm
 - Rehearsing for a final

Essential Question(s):

- How do rhythmic and melodic elements combine to create a musical composition?
- How are language arts (poetry) and music related?

<p style="text-align: center;">product</p> <ul style="list-style-type: none"> • Students will understand the technology needed to design, create, and edit a music video. 	<ul style="list-style-type: none"> • Why is rehearsal necessary in order to achieve a final product? • What technology is needed to create a music video and how is it used?
<p>Student Objective(s) (Students will know...)</p> <ul style="list-style-type: none"> • Students will know how to combine rhythmic and melodic elements in order to create an original piece of music. • Students will know how to write a poem using literary elements and devices. • Students will know how to demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. • Students will know how to use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. • Students will know technology concepts, systems, and operations. 	<p>Student Outcome(s) (Students will be able to...)</p> <ul style="list-style-type: none"> • <u>Synthesis</u>: Students will be able to <i>compose</i> an original piece of music by putting together their knowledge of rhythmic and melodic elements. • <u>Application</u>: Students will be able to <i>apply</i> their knowledge of rhythm and melodic elements by producing a written representation of their original composition. • <u>Evaluation</u>: Students will be able to <i>critique</i> their performance by evaluating the musical elements of their performance through the use of a teacher-designed rubric.
Stage 2 – Assessment Evidence	
<p>Performance Tasks:</p> <ul style="list-style-type: none"> • Composing an original song. • Design a music video through the use of a storyboard and other media. • Filming and editing a music video in order to achieve a finished product. • Song and video will be evaluated based upon a teacher-designed rubric. 	<p>Other Evidence:</p> <ul style="list-style-type: none"> • Observation • Final performance – master video

Stage 3 – Learning Plan

Learning Activities:

- Pre-unit instruction of rhythmic and melodic concepts of music
- Review concept of rhyme scheme in poetry and music lyrics
- Teacher lead instruction, plus media tutorial in the use of Finale Note Pad, GarageBand, and iMovie programs

Approximate Timeline:

Day 1-5

- Review of notes, rests, beat values, time signature, bar lines, measures, and tempo

Day 6-7

- Review of AB form
- Review of rhyme schemes in poetry and music lyrics

Day 8-16

- Find or create lyrics
- Compose a rhythm based on the lyrics
- Instruction on Finale Note Pad software
- Inputting rhythm and lyrics into Finale Note Pad

Day 17-18

- Review of Treble Clef and Bass Clef lines and spaces

Day 19-21

- Composing a melody using Finale Note Pad
- Rehearsal of song using Finale Note Pad

Day 22-26

- Creating a midi file
- Group instruction on GarageBand
- Recording vocals using GarageBand
- Creating accompaniment using GarageBand

Day 27-28

- Film video footage

Day 29-34

- Instruction on iMovie software

	<ul style="list-style-type: none"> • Edit and finalize music video <p>Day 35</p> <ul style="list-style-type: none"> • Present music videos to the class
<p>Technology and Resources to be used:</p> <ul style="list-style-type: none"> • 5 MAC desktop computers with Finale Note Pad, GarageBand, and iMovie • 10 Flip Camcorders (10 per classroom) <p>Students will use the MAC computers with Finale Note Pad software and GarageBand to compose an original piece of music. Students will then use the Flip camcorders to record a music video based on their original composition. Finally, students will use iMovie to edit and finalize their music video.</p>	

TRUSTWORTHINESS

During the design as well as implementation of my action research study, I needed to consider many aspects in order to achieve a study that was both credible and trustworthy. First, I needed to ensure that privacy and safety were provided for my students. Also, I needed to consider methods of data collection because a variety of sources were needed in order to collect the most accurate data possible. Personal biases needed to be discussed throughout the study and I needed to determine how to present my findings.

Prior to the implementation of my research study, I wanted to ensure the protection of my students. In order to achieve this, I received written approval from Moravian College's Human Subjects Internal Review Board (HSIRB). Once this approval had been granted, I next discussed in detail my study with my principal and received written approval from her as well. Finally, students and their parents or guardians were given a consent form that detailed my study and allowed the parents or guardians the right to either allow or decline without penalty their child's participation in my study. Finally, all data that I collected throughout the study guaranteed the anonymity of all students. In order to achieve this, students' names were not used but pseudonyms given. Only I had access to this information and it was kept in a secure location throughout the study. Upon completion of my thesis, this information will be destroyed.

Next, in order for my research to be considered trustworthy and credible I chose several methods of data collection to ensure triangulation. First, I incorporated “low inference descriptors” (Pulkkinen, p. 2) by implementing a double entry journal in which observations and student quotes from surveys were kept. Secondly, I employed “participant feedback” (Pulkkinen, p. 3) to ensure that the information that I had collected was accurate. Finally, I implemented “data triangulation” (Pulkkinen, p. 3). Data was collected from a variety of sources including: pre-tests, post-tests, student work samples, exit slips, and surveys.

A teacher-researcher needs to engage in prolonged data collection and that the recording of this data be done with accuracy (Hendricks, 2009). Consequently, I observed my students over a period of seven weeks and I recorded all observations in my double entry journal on a daily basis. I provided the setting, the participants, and the situations in great detail keeping facts separate from personal thoughts and impressions.

In order to ensure that I interpreted my observations accurately, I used member checks. Eder & Fingerson (2002) believed that “one reason for interviewing youthful respondents is to allow them to give voice to their own interpretations and thoughts rather than rely solely on our adult interpretations of their lives” (p. 181). Thus, periodically I talked with some participants to ensure that my interpretation of the events, were in fact accurate.

Data triangulation was achieved through the use of pre-tests, post-tests, work samples, exit slips and surveys. The information gathered from these sources were compared and interpreted resulting in themes that led to my findings.

Next, while gathering my data over the seven-week period, I considered and discussed in my journal all biases that might exist in regards towards students, setting, and the research study. Only through knowing my own biases was I better able to interpret the data being collected.

Finally, upon the completion of my thesis, I presented my findings to peers as well as to Moravian College. As a result of these findings I considered how best to implement project-based learning and how to improve its effectiveness in my classroom. Action research did not end when the data collection was over but has been a continuous process that was essential as I continued to improve classroom instruction in order to best help my students be successful.

LITERATURE REVIEW

Introduction

Dewey (1938) stated that "...the educator by the very nature of his work is obliged to see his present work in terms of what is accomplished, or fails to accomplish, for a future whose objects are linked with those of the present" (p.76). In a time when academic achievement has been called into question by government officials, the media, and parents, educators have needed to reflect upon current teaching practices and determine effective methods of instruction that will increase academic achievement as well as produce students who are problem-solvers, who are creative, who work cooperatively, who communicate effectively, and who become life-long learners. One such effective teaching strategy has been determined to be project-based learning (PBL). PBL has been described as an instructional method that improves academic achievement by creating an authentic learning experience that increases motivation, requires higher-level thinking skills, and reflects individual learning styles.

Project-Based Learning Defined

The Bucks Institute for Education (2003), an organization devoted to fostering 21st century project-based learning has defined its approach as "...a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks" (Markham et al., p. 4). It

“...is the central framework upon which the teaching and learning of core concepts is built, not a supplementary enrichment activity to be undertaken after the hard work of learning is done” (Markham et al., p viii). Thus, a carefully designed project or problem will have created a learning experience for the students that aroused a desire to learn and allowed for the formulation of new ideas (Dewey, 1938).

Three Characteristics of Project-Based Learning

Fleming (2003) stated that when implementing PBL in a classroom, there were three characteristics that needed to be present in order to have an effective project. The first characteristic was defining a clear purpose or goal for the project. This process began with creating a driving question that was directly tied to the curriculum as well as state and national standards. Once the standards were identified, the project needed to be carefully designed in order for the standards to be met (Markham et al., 2003).

The creation and use of rubrics defined the expectations of the project and the criteria by which they were assessed. According to Mergendoller & Thomas (2000), it was important to give both individual as well as group grades. Also, it was essential to remember that the final product may not reflect all the learning that had occurred so the assessing of tasks accomplished throughout the learning process should have been assessed as well (Grant & Branch, 2005).

The second characteristic of an effective project was creating context that was relevant and authentic to the students (Fleming, 2003). In authentic learning, ‘...the ideas and processes that students engage with are connected to the lived world rather than being abstracted from it’ and ‘...the solutions students produce are real solutions from real materials’ (Mioduser & Betzner, p. 61). Yamzon (1999) believed that authentic learning associated with PBL enabled students to connect the content knowledge with the application of the knowledge in real world experiences. Students questioned, inquired, researched, and designed based upon their personal interests, which resulted in a variety of possible answers. Thus, the knowledge and skills acquired can be transferred and used effectively in future life experiences (Dewey 1938).

The third and final characteristic was the creation of a product. The purpose of the product was to represent the learning that had occurred. The product was any tangible artifact such as a multimedia presentation, print material, a model, a skit, a play, a song, or a poem (Fleming 2003; Grant 2002). Finally, this product had to be presented to an audience that included other students, teachers, parents, and/or community members (Bell, 2010).

Teacher Role in Project-Based Learning

Once the project and all its expectations were established, the teacher played a vital role in the success of the project (Chanlin 2008). According to Dewey (1938), “the educator is responsible for a knowledge of individuals and for

a knowledge of subject-matter that will enable activities to be selected which lend themselves to social organization, an organization in which all individuals have an opportunity to contribute something, and in which the activities in which all participate are the chief carrier of control” (p. 56). As a result, it was the educator’s responsibility to plan, troubleshoot, instruct, monitor, and mediate.

In order to troubleshoot, the educator needed to plan and practice the implementation of the project. He/she needed to consider possible difficulties in regards to technology, group dynamics, supply needs, etc. before beginning the project as well as monitor the need for possible adjustments during the implementation of the project based upon the difficulties being experienced (Mergendoller & Thomas, 2000). This may have included the teaching of mini-lessons or the alteration of one or more tasks and/or the project.

During the implementation of the project, educators needed to monitor all aspects of the project closely including the environment as well as the student groups. In order to ensure a group’s continued progress, multiple but brief conferences should have occurred in order to discuss group goals and progress. The use of folders or other similar devices have been found to help students keep track of their progress as well (Mergendoller & Thomas, 2000).

Finally, the educator may have needed to become a mediator within a group. Consequences should have been made evident prior to implementation in regards to students who were not participating, in order to prevent such issues

from arising. However, if a group became off task or began to fall behind the timeframe, the educator needed to work with that group through discussion of goals and revised timeframes in order to get that group back on track (Mergendoller & Thomas, 2000).

Project-Based Learning and Motivation

Once the project was carefully planned and encompassed a driving question that was linked with standards, had clear expectations that were established with rubrics, and had an end goal, the product, that was presented to an audience, the project created an authentic learning experience that increased motivation, allowed for technology integrations, required higher-level thinking skills, and allowed for individual learning styles, resulting in increased academic achievement.

Bartscher et al. (1995), Bell (2010) and Fleming (2003), stated that PBL allowed students to have a greater understanding of the content because students show increased motivation to learn. According to Bartscher et al. (1995) motivation has been especially problematic during the transitional years in school including sixth grade, the middle school years, and ninth grade. They stated that the lack of motivation was due to limited or no student choice as well as a lack of meaningful learning.

In order to determine if PBL improved student motivation, Bartscher et al. (1995) conducted a research study that involved students in third, sixth, and tenth

grade from three different schools in Illinois. The purpose of the study was to determine if student motivation increased when project-based learning was implemented as opposed to traditional classroom instruction. Both students and teachers were surveyed in regards to homework completion and students were surveyed in order to determine their strengths in regards to the multiple intelligences. Based upon this data, the third grade students' project involved the study of money and culminated in a field trip to McDonald's. The sixth grade students' project was based on the book, Where the Red Fern Grows, and included trips to a game preserve and a nursing home. Finally, the tenth grade students' project focused on the novel, A Separate Piece, and included two guest speakers as well as a field trip to see a performance of five short stories.

At the conclusion of their study, Bartscher et al. (1995) determined that 82% of students felt that the project helped to motivate them. Also 93% of students felt motivated as a result of the field trips and/or guest speakers. Consequently, the researchers determined that project-based learning had increased student motivation to learn.

Increased student motivation often led to improved academic achievement. According to Grant (2002), PBL helped students to maintain interest in content being studied and motivated students to take more responsibility for their individual learning. Yamzon (1999) stated that through the solving of complex problems in PBL, students gained a greater understanding of

academic and real life skills. As a result, PBL linked the gap between acquiring the knowledge in a classroom and applying the knowledge in a real world scenario (Yamzon 1999).

Technology Implementation

Linked with increased motivation and academic achievement was the integration of technology in PBL. Blumenfeld et al. (1991) stated that technology increased interest and motivation because it created more variety, posed challenges to students, created opportunities to work with peers, and allowed for the creation of final products. By asking students to create media products such as movies, Web pages, podcasts, vodcasts, wikispaces, etc., students gained the opportunity to present their findings in a public manner that created a meaningful form of assessment (Hernandez-Ramos & De La Pez, 2009). Also, Doppelt & Barak (2002) stated that based upon student observations, classroom activities, interviews, and surveys, they found that technology integration improved student attitudes in regards to learning as well as future learning.

Hernandez-Ramos & De La Pez (2009) conducted a study to determine if students achieved greater, the same, or less understanding of content by participating in a technology-assisted, project-based learning environment as opposed to the traditional classroom approach of instruction. Two middle schools from the same district in northern California were chosen for this study. A veteran teacher and her class in one school maintained a traditional classroom

approach of instruction while a veteran teacher and her class from the other school implemented PBL. Both classes spent six weeks learning about westward expansion and incorporated a variety of resources other than textbooks, lectures, and recitation. The main difference between the two classes were (1) a culminating group project, (2) learning that occurred through group work, and (3) the use of technology to create multimedia products.

Students in both groups were given pre-tests and post-tests to determine the knowledge gained. After analysis of the data, it was determined that the students from both schools did not differ much in content knowledge on the pre-test but students who engaged in technology based PBL had greater academic gains than their counterparts on the post-test, thus determining that PBL with technology integration was an effective instructional method for these students (Hernandez-Ramos & De La Pez, 2009).

ChanLin (2008) also conducted a study to determine the effectiveness of technology integration in PBL. This study included students who ranged in age from ten to eleven and who were involved in a SciCamp (science camp). They were required to use technology in a project-based learning environment that linked their research topic (local geographical regions) and fifth-grade curriculum. Students were responsible for using technology to research, organize, and present their findings to the class. Data for the study was collected through observations, interviews, and questionnaires.

Based upon the data collected, researchers determined that students gained new knowledge as a result of the technology implementation in the project. They also, it was determined that the use of technology as a means of creating real-world experiences was more important for knowledge gain than the mode of learning used during the project.

Implementing technologies into a PBL environment has been considered important since music education has been changing and a wide variety of technologies are now being employed in the music classroom (Savage, 2005). Savage (2005) believed that it was important to embrace these new technologies and that the new technologies and skills associated with their usage should be incorporated into the music curriculum.

Outcomes of Project-Based Learning

Next, PBL may have led to increased student achievement because it required the students to use higher-order thinking skills. Markham et al. (2003) stated that the "...evidence shows PBL enhances the quality of learning and leads to higher-level cognitive development through students' engagement with complex, novel problems" (p.6). In conjunction, Bell (2010) added, "PBL is a strategy for creating independent thinkers and learners. Children solve real-world problems by designing their own inquiries, planning their learning, organizing their research, and implementing a multitude of learning strategies" (p. 39).

Consequently, higher-level thinking skills such as analysis, synthesis, and evaluation were necessary as students questioned, researched, and created.

However, PBL not only incorporated higher-order thinking skills, but it also required skills defined under the Habits of Mind, a list of skills that successful people employed when faced with a problem that had no immediate solution. Such skills included persistence, thinking and communicating clearly, creativity, imagination and innovation, metacognition, taking responsible risks, striving for accuracy, questioning and posing problems, thinking independently, applying past knowledge to new situations, and remaining open to continuous learning (Institute of Habits of Mind, 2009). These skills were deemed necessary as students continued to learn and encountered future challenges both in and out of the school environment.

Finally, PBL provided multiple opportunities for instructional differentiation as well as accommodation for different learning styles. Differentiation occurred when teachers adjusted content based upon students' individual needs and learning styles (Tomlinson & McTighe, 2006), which helped them to navigate through their zone of proximal development. The zone of proximal development has been defined as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, p. 86).

Vygotsky (1978) proposed that “an essential feature of learning is that it creates the zone of proximal development; that is, learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with peers” (p. 90). PBL incorporated this social aspect of learning by allowing the students to work in heterogeneous groupings.

Wing-Yi Cheng et al. (2008) stated that heterogeneous groupings were effective for both low as well as high-achievers. Low-achievers may have been aided by the high-achievers thus demonstrating improved understanding of the content being studied. Likewise, high-achievers may have gained skills by explaining and presenting the content to the low-achievers. However, Wing-Ye Cheng et al. (2008) also stated that in order for PBL to be an effective teaching strategy, four key elements, namely “interdependence, individual accountability, equal participation and social skills” (p. 207) must have been present within the group.

Besides heterogeneous groupings, differentiation can be implemented through student choice, graphic organizers, word walls, variety of activities, and student conferences (Tomlinson & McTighe, 2006). According to Dewey (1938/1997), the educator

“...must survey the capacities and needs of the particular set of individuals with whom he is dealing and must at the same time arrange the conditions which provide the subject-matter or content

for experiences that satisfy these needs and develop these capacities. The planning must be flexible enough to permit free play for individuality of experience and yet firm enough to give direction towards continuous development...” (Dewey, p. 58).

Thus, individual learning styles need to be considered when planning and implementing PBL.

In regards to individual learning styles, Fleming (2000) stated that PBL provided differentiation. Differentiation based upon individual learning styles has been connected with Gardner’s theory of multiple intelligences. According to his research, there were eight multiple intelligences: verbal/linguistic, mathematical/logical, spatial, kinesthetic, musical, interpersonal, intrapersonal, and naturalist (Silver et al. 2000).

Grant & Branch (2005) conducted a research study to determine how individual abilities, based upon the multiple intelligences, were reflected in a project-based learning environment. The study was conducted at a small, private middle school located in the southeastern United States, where the students were required to research human rights violations in one of five countries that the class was studying. The students were expected to write a research paper and to create a museum exhibit that would be displayed at the Human Rights Fair. The researchers interviewed, observed and gathered artifacts (student made projects and documents) from five eighth grade students.

The researchers concluded that the students were aware of their individual strengths and that the projects did reflect some of their strengths. Also, the researches concluded that project-based learning required the use of metacognition by allowing each student to take responsibility for his/her own learning. Thus, students needed to be aware of their strengths and weaknesses if they were to create and achieve self-made educational goals.

Conclusion

In conclusion, PBL with technology integration demonstrated the potential to be an effective teaching strategy that improved academic achievement by increasing student motivation, requiring higher-level thinking skills, and allowing for individual learning styles. However, there were many factors that influenced the success of PBL including: standards-based learning, authentic environment, driving question, teacher role, and clear expectations in the form of rubrics. When all aspects were brought together, it created a rich learning environment that was conducive to academic achievement.

MY STORY

How It All Began

“What information is my study going to reveal about project-based learning?” “Is this project worth all the time and effort required?” “What unexpected technology issues will occur this time and how will I resolve them?” These questions and many more came to mind as the beginning of the 2010-2011 school year was approaching. I am a middle school general music teacher and I teach grades sixth through eighth at an ethnically and socio-economically diverse school. I only work with my students for one marking period, approximately forty-five days, which does not allow much time to get the curriculum taught. I know the challenges ahead as this will be the third time that this project will be implemented in my classroom.

This project has been a baby of mine for over a year now. Myself, the other general music teacher, and our assistant principal, were selected to participate in the project-based learning initiative created by our district’s superintendent. We attended a meeting held in December 2009 and were told to dream big when designing a project. Before we began contemplating a project, we needed to determine what we wanted to accomplish. We had noticed that a majority of eighth grade general music students were apathetic about music class. Of course, there were always students who were very conscientious about their grades and always strove to do well but we wanted to reach the average to below

average students who struggled to do well in our classes mainly because they applied little to no effort. Consequently, we determined that the project needed to evolve around the application of music theory, it needed to incorporate technology, and it needed to link music with at least one other subject area.

Thus, our project was born. In very simplified terms, we decided that we would have students compose an original song, record that song, and then have them film and edit a music video, a very challenging project for both the educator and the students. We were originally told that we would receive the technology needed to implement our projects. So we designed BIG! We requested a thirty computer MAC laptop cart. I had six MAC desktops in my room and the other general music teacher had seven computers in her room. With the requested laptops we would be able to accommodate two students per computer. We also needed a minimum of twenty flip cameras, an updated version of Finale software – Print Music, and DVD's. Unfortunately, the only technology we received was the flip cameras. Consequently, instead of students working in a group of two, they now had to work in a group of four or five.

Other complications arose as a result of our limited technology. I found that the Finale Note Pad being used did not allow the printed music to be converted into midi files. Also, some desktop computers did not have the capability of burning DVD's and my laptop computer had newer versions of the software being used. Thus, when I demonstrated how to use the various software

programs, what was appearing on the interactive whiteboard was not necessarily what the students saw when they opened the software on their desktops. Through ingenuity and additional work on the part of the educator, most of the technology issues were resolved.

With great anticipation, the first day of school arrived, September 7, 2010. I had pre-determined that I was going to ask my second period, eighth grade class to participate in my study. I felt that I could get the most accurate data by using this class period because I would have taught another eighth grade class during first period and I was able to make any necessary adjustments for second period. Also, I had a planning period immediately after my second period class that enabled me to record my observations, thoughts, and any other data related to my study. By being able to record data immediately, I had the most accurate and thick descriptions possible.

Finally, my students arrived in class and we took care of the usual first day procedures. It was now time to introduce the study. Even though we were not to begin the project and study for two weeks, I wanted to introduce it as soon as possible. I explained to my students that I was attending Moravian College and that I was working towards a Masters Degree in Curriculum and Instruction. The program required me to conduct an action research study and to present my findings in a form of a thesis. I told them that I would need their parents' or guardians' permission in order for them to participate in my study. I explained

that no real names would be used, only pseudonyms. I explained that they were not required to participate and that it was their and their parents' or guardians' choice. The only difference would be that if a student participated, his/her work would be used in my study. Over the next two weeks, I received back nineteen slips that gave permission to participate in my study and two that declined.

On that first day of class, I gathered information regarding each student's background with music. This was information that I gathered each marking period because it helped me to plan the lessons and know who had more experience with music than others. Also, I used this information later in the marking period when it was time to create the groups for the project. Having at least one person in each group with a greater understanding of music theory was beneficial to each group. I gave each student an index card and asked them to tell me if they played an instrument and if they did, which instrument and how long did they play that instrument. Next, I asked them to tell me if they participated in our school's chorus, band, or orchestra. Upon reviewing the data collected, I found that I had three students who had played an instrument for four years, two students who had played an instrument for three years, and one student who had played an instrument for one year. In regards to participation in music ensembles, there were five students who were members of the chorus, one student who was a member of the orchestra, one student who was a member of both the orchestra and chorus, and one student who was a member of the band. See Table 1.1.

Table 1.1

Student Participation in Music Activities

	Pseudonym	Play Instrument	Band/Orchestra/Chorus
1.	Noel	Euphonium – 4 yrs	Band
2.	Gabriella		Chorus
3.	Samantha		
4.	Eric		
5.	Elizabeth		
6.	Jack		
7.	Katie		
8.	Anthony	Violin - 4 yrs	
9.	Katrina	Piano – 3 yrs & Viola – 2 yrs	Chorus / Orchestra
10.	Tracey	Piano (for Fun) – 4 yrs	Chorus
11.	Kristin		
12.	Amy	Piano – about 1 yr	Chorus
13.	Michelle		Chorus
14.	Heather	Violin – 3 ½ yrs	Orchestra
15.	Susan		
16.	Ken		
17.	Amber		Chorus
18.	William		
19.	Timothy		

Early Technology Concerns

I met with our technology coach to discuss some technology issues regarding the project. One issue that was of concern was the inability for students to convert their songs to a midi file so that it could be imported into GarageBand. The past two marking periods, when implementing this project, students had great difficulty singing their songs and consequently, the recordings were not of great quality. Since the students were typing their songs into a music-writing program that played the songs back for them, I thought that they could rehearse with Finale

Note Pad and then record a capella in GarageBand. This was unsuccessful. However, the dilemma I faced was that the district purchased or received free Finale Note Pad that does not allow the documents to be converted into midi files. The upgraded versions of this software, Print Music and Finale, did have the capability to convert the documents into midi files. Consequently, the technology coach and myself determined that we would have the students type their songs on the MAC computers and save it under their names on the server. They would then go into my office, log on to my computer, and open the document there. Since I had the Finale software on my computer, they would be able to convert the file and save it to the server again. When they returned to the original MAC and logged in, the converted file would be available. They would then be able to import their song into GarageBand. This way, students would have the option to sing along with the music while recording. I had hoped that this would improve pitch and lessen the rhythm difficulties that students previously encountered. I thought we had found a way to convert the files without having Finale or Print Music on all the computers. I was wrong.

It's Time to Begin

September 23, 2010, the day arrived to begin the project and to begin my study. I was excited yet apprehensive as well. That day I gave all but two of my students the pre-test. Gabriella and Tracey were absent that day and I decided to not give them the pre-test upon their return. They were present for a whole group

lesson on notes and rests prior to me being able to administer the pre-test to them. I felt that even though they were present for only one lesson, it still would have had an impact on their pre-test score and I didn't believe I could get an accurate score.

The purpose of the pre-test was to determine each student's knowledge of music theory prior to implementing the project. The pre-test included questions on names of notes and rests, beat values of notes and rests, rhythm syllables, time signatures, bar lines, treble clef and bass clef lines and spaces, and an analysis of a piece of music. That evening, I graded the pre-tests to determine their starting score. Prior to giving the assessment, I had suspected that the students who played an instrument would score higher than the students who did not play an instrument. That belief for the most part held true. Four of the top five scores were from students who played an instrument. Upon reviewing the scores, I determined that my class contained a very wide range of musical knowledge. Scores ranged from a 12% to a 96% based upon a scale with 100% being the highest. Also, eleven out of seventeen tests had scores below a 60%. This information was very informative because it helped me to determine what instruction was needed in order for my students to successfully complete the project. See Table 1.2 for specific test scores.

The project was designed in three sections: writing lyrics and composing a rhythm, composing a melody and recording the song, and filming and editing a

Table 1.2

Pre-Tests Scores

	Pseudonym	Play Instrument	Band/ Orchestra/Chorus	Pre-Test Grade
1.	Noel	Euphonium – 4 yrs	Band	96%
2.	Gabriella		Chorus	
3.	Samantha			19%
4.	Eric			12%
5.	Elizabeth			42%
6.	Jack			15%
7.	Katie			20%
8.	Anthony	Violin –4 yrs		78%
9.	Katrina	Piano – 3 yrs & Viola – 2 yrs	Chorus / Orchestra	69%
10.	Tracey	Piano (for Fun) – 4 yrs	Chorus	
11.	Kristin			54%
12.	Amy	Piano – about 1 yr	Chorus	34%
13.	Michelle		Chorus	59%
14.	Heather	Violin – 3 ½ yrs	Orchestra	84%
15.	Susan			75%
16.	Ken			21%
17.	Amber		Chorus	65%
18.	William			59%
19.	Timothy			16%

music video. In order to accomplish the first section of the project, creating lyrics and composing a rhythm, my students needed a basic understanding of rhythm. Thus, a more traditional instructional approach was employed for the first few days.

On the second day of the project, as a whole group, we reviewed the names of notes and rests from whole note/rest to eighth note/rest. We completed a worksheet together using the interactive whiteboard located in the front of the classroom. We matched names with symbols and we circled specific notes found

in music examples. We wrote in rhythm syllables below rhythms and then read the rhythms while keeping a steady beat. Finally, we determined the beat values of notes and rests, and added them together. When this review was completed, I introduced the sixteenth note and rest as well as sixteenth note patterns. The students were then responsible for completing a worksheet that was handed-in for review. I wanted to check the students' understanding of the material presented. Upon review of their work, students demonstrated an understanding of the material presented.

Even though students were demonstrating an understanding of the concepts being taught, I still had concerns about the class. This class was extremely quiet and did not have any strong personalities. There was little to no interaction between members of the class and very little participation. Upon entering my classroom, students sat in their seats and did not even talk with one another. When given the chance to work with a friend or partner during the music history portion of the class, most students chose to work independently. Usually, a quiet class would have been considered good but in the case of this project, I was asking my students to take chances and to go out of their comfort zones. I felt that I had a challenge ahead of me since there were only a few students in the class who were willing to volunteer and verbally participate in classroom activities. I did not have any idea as to how the students were going to respond to group work that required interaction and cooperation among the group members.

Also, I did not know how the groups of students were going to respond to singing and recording their songs and then presenting their songs to their peers. Based upon personal experience, being self-conscious and seeking the approval of peers has been traditionally characteristic of middle school students. This project was definitely going to test their music knowledge as well as their self-confidence.

Over the next few days, we continued this more traditional approach with lessons that were centered around the understanding of dotted notes, time signatures, and bar lines, all concepts that my students needed in order to compose a rhythm. Twice during these lessons I had students complete an exit slip that required them to use the content material being studied. The first exit slip asked students to solve mathematical equations based upon the beat values of notes and rests. The knowledge of beat values was essential if students were to successfully compose a rhythm and then accurately group their rhythms into measures. The second exit slip required the students to compose a four measure rhythm using a variety of notes and rests. Once again, students needed to be able to understand this concept in order to complete the project. I knew that if students did not know beat values and could not write four measures accurately, then they were going to struggle to complete the project.

Based upon the scores on the exit slips, I knew that Eric, Jack, Katie, and Ken were still having some difficulties with the material. They also had some of the lowest scores on the pre-test. I was not surprised that Katie and Ken were

having difficulties. Katie had an IEP and she definitely struggled in school. I often asked her if she needed help but she would always decline stating that she was fine. I knew she needed extra help but she was unwilling to receive it. Ken was a bright student who had the capability to do well if he chose. He put forth very little effort in my class and when he did work, it was with minimal effort. I had hoped that this project would peek his interest and get him involved.

I was surprised that Jack and Eric were having difficulties. Eric was a gregarious and bright student who worked hard. Jack was quieter but he did the work required of him. I have no explanation as to why these students were still having difficulties with the concepts because both students should have done better on the exit slips. See Table 1.3 for questions and scores.

As a culminating activity, I implemented the use of technology as a review. I signed out a PC laptop cart so that each student had his/her own computer. Students were required to watch a BrainPop video that was titled, *Reading Music*. Upon completion of the video, they were required to complete the online quiz that was linked to this video and then print the results for me. However, for some unknown reason, the printer decided it would not print. Because I have dealt with and used technology many times in my classroom, I was prepared. I had printed out hard copies that students could use just in case a technology issue arose. After students were finished with BrainPop.com, they

Table 1.3

Exit Slip Scores

Name	Exit Slip 1 “Complete the following math problems. Add up the beat values of the notes and/or rests to determine the numerical answer.”	Exit Slip 2 “Write 4 different measures in 4/4 time using a combination of notes and rests.”
Noel	3/4	4/4
Gabriella	2/4	4/4
Samantha	3/4	2/4
Eric	1/4	1/4
Elizabeth	3/4	4/4
Jack	1/4	0/4
Katie	1/4	1/4
Anthony	4/4	4/4
Katrina	4/4	4/4
Tracey	2/4	3/4
Kristin	4/4	4/4
Amy	4/4	4/4
Michelle	4/4	4/4
Heather	4/4	3/4
Susan	4/4	4/4
Ken	1/4	1/4
Amber	4/4	4/4
William		
Timothy	3/4	3/4

were given a choice as to either read a tutorial on rhythm at musictheory.net or play interactive music games that reviewed rhythms at musicteacher.com.

Upon completion of the review using technology, students were asked to complete an exit slip that stated, “Describe your experiences with the online tutorials, vodcasts, web sites, games, etc. that you have been using to learn about rhythm. Discuss likes, dislikes, what needs to be improved, what should stay the

same and anything else you would like to share.” When the study was designed, I had planned to create vodcasts on rhythm and melody that students could watch if they needed extra help. Unfortunately, I was unable to create the vodcasts due to time constraints.

Students’ comments about the use of technology ranged from all positive to all negative with the majority being in the middle. Positive comments included...

- “I liked the games on the music websites [*sic*]. They helped me remember notes and other stuff.”
- “I like all of the fun online games. I think we should use online instead of sitting doing work on the board [*sic*].”
- “I really enjoyed the games and activities on the website [*sic*].”

Positive comments with suggestions included...

- “I like the Brain Pop video that we watched. It helped a lot with beat values and time signatures. The games were also helpful for different things. There was nothing that helped me on rhythm syllables though.”
- “I like being able to play games while learning. I don’t like that there only a few enjoyable games. Maybe try finding another website with games like this on it [*sic*]?”
- “The online resources have been good! The games and practice quizzes helped a lot. Although the online tutorials were bad. I didn’t learn

anything from them. The online tutorials should be interactive, so they don't bore us! Although besides that, everything was superb!"

Negative comments included...

- “Frankly, the online tutorials aren't very good at all and the games are lame. Tutorials should be more interactive, and games should be more fun [*sic*].”
- “I dislike going online for learning about rhythms. It really doesn't help me learn [*sic*].”

Overall, I believe that the technology used was helpful to the students. I received six all positive comments, eight mostly positive comments, and only three all negative comments. This tells me that for the most part, students enjoyed using the technology and felt that it had helped them with learning the content material. However, I may need to do more research on the Internet to find a tutorial that is interactive in nature as well as find another web site that has more learning games.

Now that the students had a better understanding of rhythm, it was time to form the groups and begin the project. I allowed the students to choose one person with whom they wanted to work. Next, I matched the partners with other partners to form groups of four or five students. I wanted each student to work with a person with whom they felt comfortable but more importantly I wanted to make sure that the groups had a variety of ability levels.

Once the groups were identified, we were ready to begin working on the first section of the project: writing lyrics and composing a rhythm. Students needed to understand that the lyrics needed to be written in AB form and that the words in the lyrics needed to be divided into syllables. The dividing of the words into syllables was very important because when it came time to compose rhythms each syllable needed its own note or notes.

In order for students to understand that lyrics needed to be written in AB form, verse and refrain, we listened to and labeled three different songs. One at a time, the lyrics to “Viva la Vida” by Coldplay, “Turn, Turn, Turn” by The Byrds, and “Enter Sandman” by Metallica were projected onto the interactive whiteboard. After listening to “Viva la Vida,” I asked the class if anyone knew what the repeating section of a song was called. To my astonishment, Ken raised his hand and correctly answered the question. He knew that the section of music was called a chorus. I was extremely surprised that he raised his hand in class because he did little work and never volunteered. So of course, I had to call on him to answer the question. I knew that he would not have raised his hand if he didn’t know the answer. I wanted him to answer that question correctly so that he felt some sort of success in music class. Yeah Ken for volunteering! I was very surprised because I had no idea that he had any music knowledge since he rarely completed assignments. This made me hopeful that just maybe I had hit upon an interest for Ken. After listening to each song the class and I labeled and discussed

how the lyrics were written in AB form. After listening to and discussing the three songs, the students had a very good understanding of AB form.

My concern about the quietness of this class continued. Students rarely volunteered to answer a question and interaction between the students remained limited. They just did not talk. This was very odd to me as eighth graders are usually very social. This class was definitely the exception. I wasn't sure how this project was going to work with this class. This project was based upon group work and successful completion of this project required discussion and cooperation among the group members. This was going to be interesting. I did not know if the group dynamics were going to change once the group work began but we were moving forward with the project and the group work was beginning the next day.

The next day, I showed the students an example of lyrics that I had written based upon Jack Prelutsky's poem, "When I am Full of Silence." I projected the lyrics onto the interactive whiteboard and showed the poem in its original format. I discuss how I divided the poem into sections to create lyrics in AB form. I also showed the students that I had divided all the words into syllables. I told the students to not guess on the division of syllables but to use dictionary.com if they were unsure. Each group was assigned a computer to use for the project so the Internet was available for them to use.

The final step before the writing process was to begin was to review the rubric with the students. A copy of the rubric was displayed onto the interactive whiteboard and I discussed each expectation of that rubric. Each group was then given a folder that contained a rubric for each person, a copy of the lyrics from the songs we had analyzed, a copy of the lyrics I wrote based upon Jack Prelutsky's poem, "When I am Full of Silence," and a copy of the *Creating Lyrics* worksheet for each student. This folder was kept in the classroom and it was to contain each group member's work. Consequently, the materials were always available to the groups and it helped to keep the groups organized. We were ready to begin!

The class was divided into five groups. Even though there were five groups, this study focused on only four of the five groups as the fifth group contained several students who did not get permission to participate in the study. In regards to creating lyrics, each group had a choice to make. They could have either written their own original lyrics or they could have used a previously written poem and then manipulated the words to create lyrics in AB form. I checked out sixteen poetry books from the school library and had them on display in the front of the classroom for student use. Each group chose to create their lyrics based upon a poem found in the poetry books.

Group One was a group of three boys and two girls, Anthony, Eric, Tracey, Katrina, and Timothy. This group was definitely the most social as I

heard and saw talking and laughing while they worked. Consequently, I needed to watch this group to ensure that they stayed on task and kept to the time frame. This group was also strong academically and musically. Anthony had played the violin for four years. Tracey had played the piano for four years and Katrina had played the piano for three years and the viola for two years. However, while searching for a poem, Katrina expressed some dissatisfaction with the project by stating sarcastically, “This is going to be fun.” Timothy and Eric each scored very low on the pre-test yet while searching for a poem to use, Eric stated in regards to the project, “Sounds like a lot of work. I never did this before, but I think I will be good at it.” I found Eric’s statement interesting considering he was having difficulties with the music concepts taught thus far. I was glad to hear him express self-confidence.

Group Two was a group of four girls, Michelle, Heather, Katie, and Gabriella. This group was a very interesting group. Academically, Heather was labeled as gifted and Katie had an IEP and struggled in school. Musically, Heather had played the violin for three and a half years and was a member of the orchestra. Michelle and Gabriella were both members of chorus. Only Katie had no involvement in musical ensembles. As far as group dynamics, while searching for a poem, it became evident that Michelle and Heather were the leaders of the group and that Katie and Gabriella were very content to let them lead and to let them do most of the work. However, I had grouped them together because I knew

that Michelle and Heather would keep them involved and on task while working on the project.

Group Three was also a group of four girls, Elizabeth, Amy, Amber, and Samantha. This group was very strong academically. They were students who worked hard, stayed on task, and strove to do well. However, musically they were not as strong. Amy had played the piano for about one year but did not do well on the pre-test. Amber was a member of the chorus and scored fairly well on the pre-test. Elizabeth and Samantha did not belong to any music ensembles at the school and did not play any instruments. I had decided to group these girls together because I knew they would work hard and do well, even without a strong musical background.

Group Four consisted of two girls and two boys, Susan, Kristin, William, and Ken. Academically, Susan and Kristin were very hard working students who always put forth their best effort and always did well. I considered William to be an average student who did his work but didn't stand out in regards to work ethic. He did what he needed to do and no more. Ken had put forth very little effort in music class. He rarely took notes and he seldom completed assignments. The members of this group did not belong to any music ensembles in the school and they did not play any instruments. However, I knew Susan and Kristin were very strong academically and that they would do well with this project. Ken was a concern in this group. I placed him in this group because Susan and Kristin were

very strong academically. They would help to keep him on task and would help him to get his work finished. I felt that William was a good fit for this group. William listed his adjective that described himself as “responsible” but he was an average student. Working with Susan and Kristin I had hoped would increase the quality of his work that he was capable of doing.

Students had two days to choose a poem and create their lyrics based upon the poem. At the end of the second, class period, students were required to give me their *Creating Lyrics* worksheet for review. During this process, Group One chose a poem called, “Inspiration” by Charles Ghigna. Eric appeared to lead the group through the process. However, the group did not complete the task in two class periods. As a result, they came to my classroom ninth period to complete the assignment.

Group Two chose a poem entitled, “The Snowman” by Roger McGough. This group was led by Heather, who worked cooperatively with Michelle and Katie. Gabriella was often starring into space and not even looking at the poem on her paper. She waited for her group members to tell her what to write. At times, she was completely disengaged from the group as demonstrated by her leaning back in her chair with her arms crossed. This group as well needed some additional time and came to my classroom during ninth period to finish.

Group Three chose a poem entitled, “What I Do for Love” by Brod Bagert. This group was on task and worked well together. They discussed as a

group how to create AB lyrics based upon the words of the poem. Elizabeth and Amy both used dictionary.com to check syllable division. In fact, this group actually completed their work early.

Group Four chose a poem called, “I Often Repeat Myself” by Jack Prelutsky. Susan and Kristin were the leaders and they did manage to get Ken to complete his *Creating Lyrics* worksheet. William did his work but he was not putting forth the effort that I had hoped would emerge while working with Susan and Kristin.

Once each group’s lyrics were given to me, I checked to make sure that their lyrics were in AB form and I checked to ensure that their lyrics were divided correctly into syllables. I made all necessary corrections and returned the students’ papers the next class meeting. We were ready to begin composing the rhythm of their songs.

At the beginning of the next class, I demonstrated how to take the lyrics and compose a rhythm based upon those lyrics. Once again, I used the poem “When I am Full of Silence,” by Jack Prelutsky. I gave each student an *Adding Rhythms to Words* worksheet and also displayed it on the interactive whiteboard. I demonstrated how I composed the rhythms for verse one using a Think Aloud. During the Think Aloud I covered the following material...

1. Students needed to know how they wanted to rhythmically say the words before composing.

2. Once it was determined how the words were to be spoken, the stressed syllables were circled. The stressed syllables became the beats.
3. After the beats were determined, the number of syllables determined the type of note or notes needed to correctly represent the rhythm being spoken. For example, if there were four syllables on one beat, that was represented by four sixteenth notes.
4. Finally, after the rhythms were all written, they needed to be grouped into measures of four beats. Rests sometimes needed to be added to complete measures or for pick-up notes.

I chose to employ the Think Aloud technique because I wanted the students to understand the thought process required to complete the task.

After I completed verse one, the students and I worked together on verse two. We decided how we wanted verse two to be spoken and then we circled the stressed syllables. Finally, we composed the rhythm and grouped the rhythms into measures. During this process, students were required to write the example on their worksheets. Students stated that they understood the process. Before the groups began working on their own lyrics, I reminded them that all the refrains in their songs should be identical since the words in the refrain were identical and that all the verses should be very similar. The rhythm of a verse would only be adjusted due to more or less syllables in a phrase. Students were given four days to compose their rhythms and create a finished version using Finale Note Pad.

While students were working on the lyrics, I decided to spend some time observing the groups. I first observed Group One and I noticed that Katrina was not writing anything down and in fact was drawing on her pants with her pencil. Also, Anthony was a mystery to me. He was gifted musically yet he didn't seem to be putting forth much effort. He never smiled and he gave the impression that he did not enjoy music class. However, this was the first group to really begin interacting with one another both socially and academically. They all were discussing the lyrics and what rhythms they wanted to use for their song.

Group Three was very quiet in the beginning. It was as if each member was waiting for another member to make decisions about their song. After some time, Elizabeth and Amy began discussing what they needed to do in order to achieve the task assigned. Finally, some talking and interaction occurred!

Next, I noticed Kristin and Susan taking charge in Group Four. They really seemed to be enjoying the project and were working well together to create their rhythms for their song. However, William sat one chair away from the group. I was not sure if he just wasn't comfortable working in a group and so he remained quiet and aloof or if he was content to have others do the majority of the work.

It was on the second day of this portion of the project that I introduced Finale Note Pad to the students. The issue that arose with teaching Finale Note Pad was that I did not have it on the laptop because I have the Finale software

instead. Consequently, I downloaded a free demo of Finale Note Pad onto my husband's laptop and created a tutorial for the students using his computer. The tutorial incorporated photos and written directions for creating a document with Finale Note Pad. Unfortunately, I was unable to demonstrate the exact process using the interactive whiteboard. I showed the process using Finale and discussed the differences they were to encounter. I talked about the tutorial and told them to be sure to read it and to follow the step-by-step instructions it listed. What made this process even more difficult was that the students were using different versions of Finale Note Pad. Some had newer versions and some had older versions. As a result, students were encountering differences from what the tutorial showed. Thus, as groups began using the software, I spent much of the class time working individually with groups on how to use Finale Note Pad. This took time away from me helping students compose their rhythms.

I noticed on this day that the groups were definitely becoming more social and that all students were participating. The participation for some students was limited but I felt hopeful because they still were participating. Working in groups seemed to be helping this class. They were finally talking, working, and discussing. They were becoming active participants in their education.

It was during this section of the process that the MAC laptop I used began to experience technical problems. The tech department needed the laptop to determine the issue involved and no time frame was given as to when I would get

the laptop back. Thus, without a laptop, I was very limited in the demonstrations I was able to present to the class. This was very stressful because I knew the limited amount of time we had as a class to complete this section before we moved onto the next section. I needed the laptop back as soon as possible.

During these four days, I met with each group regarding the composing of their rhythms. Anthony from Group One was writing out the rhythms for his group and asked my opinion of their rhythm. It was mainly quarter notes so I suggested that they add some other notes to create a greater variety. This would make the song more interesting for the listener. Katrina still caused me concern. She asked me if every member needed to write a copy of the rhythms. She was a bright student who had a strong musical background but she just did not want to put forth much effort for this project. Both Group One and Group Two needed some help with rhythm writing. Working with each group separately, I helped them to compose a rhythm for the first line of their lyrics. Afterwards, they had a better understanding of how to compose a rhythm based upon their lyrics and I observed them working on, and composing rhythms later in class. Group Four did not need help with composing rhythms, however I discussed with Kristin and Susan that I knew that they were doing the majority of the work. I expressed my belief that they needed to gently push William and Ken to do more work. Each group was progressing and eventually began using the Finale Note Pad software in order to write and print a finished version of their lyrics and rhythm.

The day that the groups began using Finale Note Pad was extremely frustrating. I had created the tutorial that walked them through the process of creating a new document as well as how to use the software. Instead of reading the tutorial, students continually asked for my help! The entire class period was very hectic as I went from group to group to help with Finale Note Pad. Students should have been able to create their documents without the amount of help that they were requiring from me. Group Three actually inputted their rhythm incorrectly and needed me to fix the problem. I sat down with them and showed them where they went wrong with inputting the rhythms. I fixed the first three measures and told them that they needed to correct the remaining document. The only group that worked independently was Group One. They understood the rhythm writing process and they quickly understood how to use the Finale Note Pad software. Anthony was definitely the leader musically and technically. However, it was Eric who was driving this group. During the composing, he sang the lyrics and tried to figure out the rhythms.

While working with groups on the computers, I was also trying to help groups with rhythms. Group Two had requested my help because they were experiencing difficulties with creating a rhythm for a particular line from their lyrics. I worked with them and eventually they were able to compose the rhythm. Once this group moved to the computers, Michelle and Heather led the group through the inputting process. Katie who had an IEP became very frustrated with

the computers because she had a difficult time understanding the program and Gabriella was still not putting forth the effort needed.

During the four days of rhythm writing and working on the computers, I gave the students an exit slip that stated, “Composing a rhythm is like...”

Students were required to finish the statement before leaving class. I received a wide range of responses from composing rhythms was easy to very difficult.

Some responses included...

- “Taking a test and trying to figure out the problem [*sic*].”
- “It is like a brainteazer puzzle in the sense that it is fun but confusing and fusterating [*sic*].”
- “writing an essay that’s 10 pages long [*sic*].”
- “nailing jello to a tree [*sic*].”
- “A dark night [*sic*].”
- “A walk in the park, because Finale Note pad [*sic*] is very easy to use. Plus, most of the people in my group know how to read music.”
- “deciding what to eat for lunch [*sic*].”
- “A challenge, It’s fun but crazy at the same time. But sometimes you think you can’t get it done [*sic*].”
- “drinking chocolate milk it is so easy [*sic*].”
- “a stran of sunlight coming threw the clouds [*sic*].”
- “fun when everyone in your group actually works together [*sic*].”

One of my favorite quotes from this study came from this exit slip. Composing a rhythm is like “nailing jello to a tree [*sic*].” I was able to picture in my mind someone literally trying to nail jell-o to a tree with a hammer and nail. However, the jell-o kept sliding off the nail and falling to the ground. The process was repeated but the results were the same. It would be practically impossible to nail jell-o to a tree so I could see the frustration of the person who was trying to accomplish this task. The student was using this simile to express his/her frustration at trying to compose a rhythm for his/her song. This student must have been writing and rewriting rhythms during the process and wasn't feeling much success. This use of figurative language was significant because it makes me, the educator, aware that the student needed help and guidance with the task. Otherwise, if frustration occurred, the student could possibly give up and stop trying which would defeat the purpose of the task. Students needed to be challenged but not to the point of frustration.

Another quote really struck me. A student said that, Composing a rhythm was ‘like a brainteaser puzzle in the sense that it is fun but confusing and fusterating [*sic*].’ The student was comparing what it was like to compose a rhythm to what it was like working on a brainteaser puzzle. Brainteaser puzzles were meant to be challenging yet doable. Often brainteaser puzzles require the doer to try different approaches in order to solve it. I believed the student was expressing the process that he was experiencing in composing a rhythm. Even

though he found it confusing and frustrating, he still enjoyed the challenge and was having fun with it. This response was significant because it told me that the student was having some difficulties, however, he was working through the process and felt that the task was doable.

The day arrived that the final copies of the lyrics and rhythms were due. Each student was to hand in his/her own copy with the rubric stapled to the top. It was a busy day with helping the students finish. During this class period William and Ken were not sitting with their group at the computer but instead were sitting in their seats. William was looking at the lyrics but not doing anything with them and Ken was drawing. I talked with them and told them that they needed to go and help their group at the computer. They went over and sat with Susan and Kristin but did not help. I was surprised that William was not more involved. Ken was not a behavior problem in class and he often did work when prompted. However, he showed no initiative to be an active participant.

The next day, students were required to record their lyrics in Moodle. I had set up a class for my eighth grade general music students in Moodle and had added each of my students to the class. This process was time consuming but Moodle provided me with an excellent way to have students record themselves performing their lyrics. I felt that each student should have had some individual accountability for his/her grade on the lyrics and rhythm product. While inputting the lyrics and rhythms into Finale Note Pad, I had continually reminded the

students that they were required to record their song in Moodle. I told them that they should have been practicing speaking their lyrics using the correct rhythms and that they needed to practice using Finale Note Pad. Finale Note Pad had the capability to playback the rhythms inputted. The day before the students were to record, I had one student go through the process of recording to ensure that there were no glitches and that the assignment I had set up in Moodle was operational and ready for the next day. The process went smoothly and I thought we were ready to record. Silly me!

The day of recording was absolute chaos in my classroom! Even though I had previously done this project with other classes, I had never previously required students to record in Moodle. I had checked out a PC laptop cart so that each student would have his or her own computer to record. For some unknown reason, the PC laptops take five and sometimes ten minutes to long into the network. I knew this, so I had students get a laptop as soon as they entered the classroom and had them log in. While the computers were accessing the network, I demonstrated how to access Moodle and record. Overall, most students were able to record just as I had planned using Moodle. However, some laptops did not allow the students to record using Moodle. Why? I didn't know. I put in a tech request immediately but never received an answer as to why the problem occurred or how to solve the issue. Consequently, students had to record using an application on the PC's and then either email me their recordings or place them in

my dropbox on my web page. Some students were not even able to do this so I had them speak the rhythm in my presence. With recording finished, I was ready to grade the lyrics and rhythms that were eventually to be songs.

The scores, based upon the rubric, showed that all the groups had an understanding of AB form. They had created lyrics that included three verses and a refrain. Three of the four groups accurately divided all words into syllables and created a rhythm, one note per syllable, based upon the lyrics. The one group who scored a four out of five points only had one error. They divided the word “smile” into two syllables when it should only be one syllable. All groups used a minimum of five different notes and/or rests and they all successfully used Finale Note Pad to create their finished documents. The use of Moodle and the recording of the lyrics was where students lost most of their points. In regards to using Moodle, all but three students used Moodle to record their lyrics. Two students had technology issues and were unable to record. I did not take any points away from these students since they tried numerous times to record in Moodle. I gave them full credit and instead of recording, I had them read their lyrics to me. Only one student did not record his lyrics and that was Ken. I gave him ample opportunities and time to record but he chose not to do it. Consequently, he received a one out of five causing his score to be lowered. The real issue that caused a loss of points was the inability to read the rhythms accurately. Students were able to compose rhythms and group them into

measures but they lacked the ability to perform them correctly. Students had difficulties with keeping a steady beat and speaking the lyrics using the rhythms they had composed. There was only one student who received a four out of five points and the remaining students received mostly threes and twos. Finally, all but one group gave me their assignment on the due date. One group gave it to me one day late. See Tables 1.4 through 1.7 for each group's lyric/rhythm scores.

The rubric did not grade the lyrics based upon proper punctuation and capitalization. However, while I was grading the songs, I corrected all punctuation and capitalization errors and noticed that there were many errors on all papers. Groups ranged from fifteen to sixty-five punctuation errors and eleven to twenty capitalization errors. I found these errors to be unacceptable from eighth grade students. As a result, I changed the rubric for future classes to include the expectation of proper punctuation and capitalization. See Table 1.8 for capitalization and punctuation errors.

Composing a Melody

Now that the groups had written their lyrics and had composed a rhythm, we were ready to begin the second phase of the project: composing a melody, recording the song, and creating an accompaniment. Before group work began, we spent three days reviewing and practicing reading treble clef and bass clef lines and spaces. We spent the first day working on treble clef. We reviewed lines and spaces, students completed a worksheet, and then they practiced on the

Table 1.4

Group One's Lyrics/Rhythm Scores

Group 1	Tracey	Timothy	Katrina	Eric	Anthony
Lyrics are written in AB form with a minimum of three verses.	5/5	5/5	5/5	5/5	5/5
Lyrics are divided accurately into syllables and there is at least one note per syllable.	5/5	5/5	5/5	5/5	5/5
A minimum of five different notes and/or rests are used.	5/5	5/5	5/5	5/5	5/5
Student used Finale note Pad to create his/her final copy. All elements are included: title, composers' name, and lyrics.	5/5	5/5	5/5	5/5	5/5
Student recorded his/her song using Moodle.	5/5	5/5	5/5	5/5	5/5
Performance had a steady beat and all rhythms were accurate.	2/5	3/5	3/5	3/5	3/5
Project was handed-in on the due date.	5/5	5/5	5/5	5/5	5/5
Score	88%	92%	92%	92%	92%

Table 1.5

Group Two's Lyrics/Rhythm Scores

Group 2	Gabriella	Michelle	Heather	Katie
Lyrics are written in AB form with a minimum of three verses.	5/5	5/5	5/5	5/5
Lyrics are divided accurately into syllables and there is at least one note per syllable.	5/5	5/5	5/5	5/5
A minimum of five different notes and/or rests are used.	5/5	5/5	5/5	5/5
Student used Finale note Pad to create his/her final copy. All elements are included: title, composers' name, and lyrics.	5/5	5/5	5/5	5/5
Student recorded his/her song using Moodle.	5/5	5/5	5/5	Tech Issue
Performance had a steady beat and all rhythms were accurate.	3/5	3/5	4/5	3/5
Project was handed-in on the due date.	4/5	4/5	4/5	4/5
Score	89%	89%	93%	89%

Table 1.6

Group Three's Lyrics/Rhythm Scores

Group 3	Samantha	Amy	Elizabeth	Amber
Lyrics are written in AB form with a minimum of three verses.	5/5	5/5	5/5	5/5
Lyrics are divided accurately into syllables and there is at least one note per syllable.	4/5	4/5	4/5	4/5
A minimum of five different notes and/or rests are used.	5/5	5/5	5/5	5/5
Student used Finale note Pad to create his/her final copy. All elements are included: title, composers' name, and lyrics.	5/5	5/5	5/5	5/5
Student recorded his/her song using Moodle.	5/5	5/5	5/5	Tech Issue
Performance had a steady beat and all rhythms were accurate.	3/5	3/5	3/5	2/5
Project was handed-in on the due date.	5/5	5/5	5/5	5/5
Score	90%	90%	90%	86%

Table 1.7

Group Four's Lyrics/Rhythm Scores

Group 4	Susan	Kristin	William	Ken
Lyrics are written in AB form with a minimum of three verses.	5/5	5/5	5/5	5/5
Lyrics are divided accurately into syllables and there is at least one note per syllable.	5/5	5/5	5/5	5/5
A minimum of five different notes and/or rests are used.	5/5	5/5	5/5	5/5
Student used Finale note Pad to create his/her final copy. All elements are included: title, composers' name, and lyrics.	5/5	5/5	5/5	5/5
Student recorded his/her song using Moodle.	5/5	5/5	5/5	1/5 Did not Record
Performance had a steady beat and all rhythms were accurate.	3/5	3/5	2/5	0/5
Project was handed-in on the due date.	5/5	5/5	5/5	5/5
Score	92%	92%	88%	72%

Table 1.8

All Groups' Punctuation and Capitalization Errors

	Group 1	Group 2	Group 3	Group 4
Punctuation Errors	15	15	24	65
Capitalization Errors	17	11	20	12

computers using musictheory.net. The second day was spent working on bass clef and the same procedure as the previous day was followed. The third day, I discussed with the students that notes in a song mainly moved by steps, skips, and repeats. Sometimes leaps were used but they should only be used in a very limited quantity.

The next day, prior to students beginning their work, I demonstrated how to use Finale Note Pad to write their melodies. I used the song that I had composed for this project and demonstrated using the interactive whiteboard. My lyrics and rhythms were displayed and I showed them that the notes could be moved up and down the staff by using the arrow keys. Also, I explained that each verse and refrain needed to begin and end on a “C.” Because their songs were composed in the Key of C, the “C’s” in the music created a sound of completeness or a feeling of ending. The groups began composing their melodies.

While the groups began their work, I met with the groups individually to discuss their rhythms. I read their lyrics using the rhythms they had composed so that the groups were able to hear what they had actually written. We also discussed any rhythms that seemed awkward or difficult to say. The groups seemed appreciative of the help and were encouraged to make the desired changes prior to finishing their melodies.

During this process, most students appeared to be engaged. This was excellent to see because this class began the marking period with little to no

volunteered participation. In fact, they barely even talked to one another before, during, or after class. It wasn't until the groups were formed and the project began that the students became active participants in their learning. Confirming my belief that the students were learning, I heard students from Group Two discussing their song and actually using music terminology in their discussion. Unfortunately, there were still those few students who were content to let others do the work. Ken and William still sat in the background and had Susan and Kristin doing most of the work. However, one day the girls told the boys that they needed to do some work on the computer and William and Ken did. I noticed over the next few days that Susan and Kristin worked at the computer for half of the class period and then Ken and William worked at the computer for the second half of the class period. I was very glad to see that they finally required the boys to do more work.

The only other student who seemed to be disengaged from his group was Timothy from Group One. He often sat behind the others with little to no interaction with the group. Except for Timothy, Group One became a group of dominant personalities. Anthony became the leader of the group and I think wanted this to happen. He seemed to be in charge of the project and was apprehensive of letting others work on the computer. Tracey, and in particular Kristina and Eric became very social. They were often seen socializing instead of working. I often had to remind this group to focus and get back to work.

However, this group was getting their work finished and in fact, they were ahead of the other groups.

It was during this process that I had the students complete an exit slip asking them to discuss how their group was working. I asked them to discuss their groups' strengths, weaknesses, and any problem(s) that they might be experiencing. Finally, I asked them to tell me if they needed help resolving any issues in their group.

Group One felt that they were working well together but that maybe there was a little too much talking at times.

Anthony: "My group is getting along fairly well, it's just some work more that others [*sic*]."

Tracey: "This project is really fun. I think this because we get to see how to make song, record it, and make a music video. I like my group because we all have really good ideas for the song. 😊"

Katrina: "My group is working good together, and we all have different jobs. Because there is five of us, it is hard for all of us to agree on an idea, besides that it's good [*sic*]."

Timothy: "we do our work but we are to talken. we have to work on that [*sic*]."

Group Two expressed that they had some issues within the group regarding cooperation but that they were able to work through the problems. Their comments included...

Michelle: "Our, group is fine we work to getter really well. We do have some argonents but we get through them [*sic*]"

Heather: "Fine. Some tech. problems originally. Not entirely cooperative person in group, won't say who [*sic*]."

Katie: "My group is working fine sometimes we get annoyed with other but that's Normal Our song sounds good and Its been fun working on it [*sic*]."

Group Three stated that they also were working very well together and that they had no concerns within their group.

Elizabeth: "We are working well together. We all help each other and figure out what we are going to do. We made a lot of progress since we first started."

Amy: "our group is fine, we have lots of fun and no problems [*sic*]."

Amber: "My group is working good [*sic*] together. Each person has a 'special talent' they are good at. We communicate well and get our work done."

Samantha: "We are doing well just having a little trouble but not a lot, trying to figure out what to do on garage band [*sic*]."

Finally, Group Four felt that their group was also working well together. They stated that they were moving slowly but accomplishing what needed to be achieved. I thought that this was interesting considering Susan and Kristin were doing the majority of the work.

Susan: “We are moving slowly and having trouble with working quickly. Overall we are coming along fine though.”

Kristin: “My group is working very well, we just all have to work together more. We need a lot of help, but mostly because of the computer being stupid [*sic*].”

William: “good cooperation good confidence [*sic*]”

Ken: “We work together good [*sic*]. Can’t figure out some of the proper notes.”

On another day during this process I was able to observe the groups again. I noticed on this day that Anthony in Group One let others do some of the work. His relinquishing some control was good for the group because it put some responsibility on the other team members to accomplish some work. Katrina who had been sitting on the floor and talking with Eric now sat at the computer and was working. Tracey was discussing with the group that she did not want the electric guitar used in the song. The group was back on track except for Timothy who still remained quiet.

A member of Group Two made an interesting comment that day. Katie and Gabriella were absent so it was just Michelle and Heather working on the project. Michelle said to Heather, “Look how much we got done when they’re not here.” Based upon this statement, I wondered what the issue was the led to such a statement. Knowing the students in the group and watching them for several weeks I had a rather good idea about the issue. Katie was not the most cooperative group member. She was easily frustrated and this frustration manifested itself in hostility. Katie was a student with an IEP and she had some issues that were beyond her control. I believe she wanted to do well but just did not have the capability to grasp all concepts academically and socially.

Group Three seemed to really enjoy working on their song and they were very excited about the product they were producing. Such comments as, “That’s cool.” and “That’s awesome.” were expressed by the members of the group. Hearing such statements meant to me that students were enjoying the work and if students were enjoying the work, then they were probably learning. I wanted this project to create a learning experience that was fun yet academically challenging.

As the time neared for the recording of the songs to begin, students began to express some concerns about singing. In order to alleviate some of their fears I decided to talk with the class as a whole group. I explained that it was their choice as to whom sang the song. It could be one member from the group or two members or three members or the entire group. I also told them that once the

recording was finished, it was possible to alter the sound of their voice in GarageBand by adding reverb and/or echo to the track. This seemed to reduce the anxiety the students were feeling in regards to recording their songs.

In an attempt to help students sing in tune during the recording process, I had students create midi files of their songs. Once the midi files were created, they were then imported into GarageBand. As a result, students were able to sing along with the melody of their song while recording. One would think that this was an easy process but it was far from it. It should have been an easy process but once again, due to technology limitations, a process that should have been quick and simple became tedious and almost chaotic.

Students were using Finale Note Pad and this software did not allow for the creation of midi files. However, I had the Finale software of the MAC laptop. I originally had thought that the students would save their documents onto the server under their name. They would then be able to log into the computer in my office and open their document. Once the document was opened in my computer, they would then be able to convert their document to a midi file, using Finale. They would then save that file back onto the server and open it on the original computer they were using and then they would have their midi file. Even as complicated as this sounded, that would have been easy. For some unknown reason, when students logged into the server on the MAC desktops in my classroom, their names appeared, however, anything that they saved under their

name was only viewable on that computer. Consequently, when students logged into my computer, the documents were not appearing. Once again, I put in a tech request. An individual from the tech department came to my room within a day or two of the issue arising. This person had no explanation as to why the documents were not appearing on other computers. Everywhere else in the building, when students accessed the server, their documents appeared regardless of which computer they were using. This issue has never been resolved.

Once I realized that the documents were not appearing on my computer, I had to think quickly and devise a new plan immediately. So, I went to each computer and had the students save their songs onto my flash drive. Each group then went to my laptop and the students opened their documents there. I walked them through the process of converting their files from a document to a midi file. They then saved their midi file back to my flash drive and then returned to their computers. There they opened my flash drive again and saved the midi file to their desktop. It became a very slow and tedious process, but it worked.

While students were converting their files, I had the remaining students practicing their songs in preparation for the recording. I also told the groups to begin thinking about their music video. They needed to begin mapping out the video (i.e. storyline, props needed, location(s), etc.). We were definitely in the multi-tasking stage of the project.

Now that the songs were imported into GarageBand, students needed to know how to record their songs and how to create an accompaniment. Using the laptop and the interactive whiteboard, I did a demonstration for the class on how to use GarageBand. Even though my version of GarageBand is newer than the version on the students' desktops, they were similar enough that the students gained a basic understanding of the program. I taught students how to find the music loops, sound effects, and stingers and how to create tracks based upon the loops. I also taught the students how to delete or alter tracks as they worked through the process of creating the accompaniment for their songs. Finally, I demonstrated how to record which required them knowing how to create a real instrument track, adding vocals with no effects, and raising the gate to lessen background noise. I also explained that after they were finished recording, they could choose to alter their voices by adding effects, reverb, or echo.

In order to help students with feeling a steady beat while they recorded their song, I had students add a drum track first. The reason I had them add a drum track was because while I was recording my sample song, I noticed that it was much easier to sing along with the music from the midi file, their melody, when a drum beat was present. Once the drum track was finished, the groups were ready to record.

Because all six computers in my room were grouped on one wall, it was very crowded and noisy when students were working on them. Thus, I decided to

create a “recording studio” for my students. Actually, it was my office and I had placed one of the six desktop computers in there on a desk. This way, one group at a time could use my office and have privacy while recording their song. Students felt more comfortable that they were not singing in front of other students, plus it lessened the background noise a great amount. I was able to do this because my office had windows that allowed me to watch both the students in my classroom and the students in my office at the same time.

The idea of creating a “recording studio” was not without its downside. Because students were working on a different computer, I had to once again transfer the songs using my flash drive. As groups were ready to record, they saved their GarageBand file onto my flash drive and downloaded it onto the computer in my office. When they were finished recording, they would save their new GarageBand file onto my flash drive and download it onto their computers. It was a time consuming and tedious process but I believed it was well worth it considering the quality of the recordings was much better due to less noise.

After the recordings were finished, the groups needed to finish adding their accompaniment and submit their finished version of their song. Students had been given a rubric prior to starting this portion of the project. Students were required to submit a printed copy of their song with the rubric. The grade was based upon melodic content, technology use, lyrics, and due date. I examined the songs to determine if the verses and refrain had a melodic tune and that each of

the verses and refrains began and ended on the note “C.” I checked that the final copies included the title, the composers’ names, melody, dynamic markings, and lyrics. The rubric also stated that the tempo and chords should have been included. However, with time constraints due to technology issues, I did not include tempo or chords in my expectations because I was not able to teach those concepts to the class. This time, the rubric stated that the lyrics needed to contain proper punctuation and capitalization.

The groups did well on this assignment. All groups received five out of five points for the melodic content. They all had created a melody for their song and all their verses and refrain began and ended on a “C.” Also, all groups received five out of five points for technology use. They all created their final copies using Finale Note Pad. Finally, all groups submitted their project on time thus receiving five out of five points. However, students continued to have difficulties with punctuation and capitalization in their lyrics. Even though I had made all the corrections on their rhythm copy, students did not make all the necessary corrections. For example, Group One had fifteen punctuation errors and seventeen capitalization errors on their original lyrics/rhythm document. On the melody document, Group One still had nine punctuation errors and fourteen capitalization errors. I had decided to give them three out of five points on their rubrics because many of the errors were found in the refrain. Since the refrain repeated, I didn’t feel that they should be penalized for the same errors. Group

Two originally had fifteen punctuation errors and eleven capitalization errors. On their melody document, they had three punctuation errors and one capitalization error. Group three went from twenty-four punctuation errors and twenty capitalization errors to zero punctuation errors and only one capitalization error. Consequently, all but one group lost points for capitalization and punctuation errors. See tables 1.9 through 1.13.

Filming and Editing a Music Video

The groups were now ready to begin filming and editing their music videos. Students had two days to film using flip cameras. They were allowed to use the classroom, the hallway outside the classroom, the auditorium, and/or go outside to the area immediately next to my classroom. The stage of the auditorium can be accessed from my classroom so students were always close by. Also, if students chose to film outside, then the doors leading from my classroom to the outside had to remain open. Students were required to write down on the chalkboard where their group was at all times. Also, the other music teacher's class was filming as well, so the two of us were continually patrolling the different areas to ensure that the students were getting their work accomplished. I told the students that they should film about five minutes of video. Their videos would only be about two minutes in length and if they had extra footage, then they would be able to do more with the video because they could pick and choose which footage to use. The flip cameras were extremely easy to use. When the

Table 1.9

Group One's Melody Scores

Group 1	Tracey	Timothy	Katrina	Eric	Anthony
Verses and/or refrain have a melodic tune and each verse and/or refrain begins and ends on "C."	5/5	5/5	5/5	5/5	5/5
Student used Finale Note Pad to create his/her final copy. All elements are included: title, composers' name, melody, dynamic markings, and lyrics.	5/5	5/5	5/5	5/5	5/5
All lyrics were properly hyphenated and capitalized. Proper punctuation was used.	3/5	3/5	3/5	3/5	3/5
Project was handed-in on the due date.	5/5	5/5	5/5	5/5	5/5
Score	92%	92%	92%	92%	92%

Table 1.10

Group Two's Melody Scores

Group 2	Gabriella	Michelle	Heather	Katie
Verses and/or refrain have a melodic tune and each verse and/or refrain begins and ends on "C."	5/5	5/5	5/5	5/5
Student used Finale Note Pad to create his/her final copy. All elements are included: title, composers' name, melody, dynamic markings, and lyrics.	5/5	5/5	5/5	5/5
All lyrics were properly hyphenated and capitalized. Proper punctuation was used.	3/5	3/5	3/5	3/5
Project was handed-in on the due date.	5/5	5/5	5/5	5/5
Score	92%	92%	92%	92%

Table 1.11

Group Three's Melody Scores

Group 3	Samantha	Amy	Elizabeth	Amber
Verses and/or refrain have a melodic tune and each verse and/or refrain begins and ends on "C."	5/5	5/5	5/5	5/5
Student used Finale Note Pad to create his/her final copy. All elements are included: title, composers' name, melody, dynamic markings, and lyrics.	5/5	5/5	5/5	5/5
All lyrics were properly hyphenated and capitalized. Proper punctuation was used.	4/5	4/5	4/5	4/5
Project was handed-in on the due date.	5/5	5/5	5/5	5/5
Score	96%	96%	96%	96%

Table 1.12

Group Four's Melody Scores

Group 4	Susan	Kristin	William	Ken
Verses and/or refrain have a melodic tune and each verse and/or refrain begins and ends on "C."	5/5	5/5	5/5	0/5
Student used Finale Note Pad to create his/her final copy. All elements are included: title, composers' name, melody, dynamic markings, and lyrics.	5/5	5/5	5/5	0/5
All lyrics were properly hyphenated and capitalized. Proper punctuation was used.	5/5	5/5	5/5	0/5
Project was handed-in on the due date.	5/5	5/5	5/5	0/5
Score	100%	100%	100%	0%

Table 1.13

All Groups' Punctuation and Capitalization Errors

	Group 1	Group 2	Group 3	Group 4
Punctuation Errors	9	3	0	0
Capitalization Errors	14	1	1	0
Syllable Errors	0	3	0	0

groups were finished filming, all they had to do was insert the flip cameras into the USB ports on the desktop computers, click "Import" after iPhoto opened up, and then the footage downloaded to iPhoto.

The next step was to export their song from GarageBand and create an iMovie. I demonstrated to the class how to create an iMovie project, showing them how to find their videos through the media tab. I also showed them how to split and delete portions of their videos, how to add titles and transitions, and how to add effects to their videos. Of course, the version of iMovie on the laptop was newer than the version on the students' desktops. So, I hooked up one of the student desktops to the interactive whiteboard so that I could demonstrate the program. Once the students were working at the computers, I went to each group and walked them through the process of exporting their song from GarageBand and importing it into iMovie. I felt that students needed that one-on-one attention in order to successfully export and import their songs. For the next several days, students worked on creating their videos and I was available to help the groups as questions or issues arose.

It was three days prior to the end of the marking period and the students had been working on this project for approximately seven weeks. Videos were finished and it was time to present them to the class. Students were given a rubric at the beginning of this section of the project. The expectations of the rubric included video elements, song elements, due date, and teamwork. For video elements, the title of the song, composers' names, no misspellings, and smooth transitions were required. For song elements, the song with an instrumental accompaniment was required to be in the video. Students were expected to

complete the project on time and finally, students were held accountable for their individual effort throughout the process. Each group member was given a *Teamwork Rubric* and asked to score the other members of his/her group. I averaged the scores that each person received and that was added to the *Music Video Rubric*.

All students did well for this assignment. All groups received full credit for the video and song elements and all groups submitted their project on time. The differences in scores were a result of the *Teamwork Rubric*. I included a teamwork score because not all students applied as much effort as others. Consequently, their scores should reflect that distinction. In Group One, Timothy scored the lowest for teamwork, which did not surprise me. He often was not involved when I observed his group. Katie scored low for teamwork in Group Two. This also did not surprise me because Katie had difficulty with understanding musical concepts as well as difficulty with using the computers. She was the type of student that when frustration occurred, she would shut down. Group Three was a very cohesive group and all scored high for teamwork. My biggest surprise came when I added the scores for Group Four. I was shocked that William received fourteen out of twenty teamwork points and Ken received sixteen out of twenty points. I really expected their scores to be lower and in particular for Ken's to be the lowest in the group. Ken had put forth only minimal effort through the entire project. See Tables 1.14 through 1.17.

Table 1.14

Group One's Video Scores

Group 1	Tracey	Timothy	Katrina	Eric	Anthony
Video contains a title, composers' names, no misspellings, and smooth transitions.	5/5	5/5	5/5	5/5	5/5
Video includes recorded song and an instrumental accompaniment.	5/5	5/5	5/5	5/5	5/5
Project was handed-in on the due date.	5/5	5/5	5/5	5/5	5/5
Combined group teamwork score.	20/20	14/20	19/20	18/20	19/20
Score	100%	88%	98%	96%	98%

Table 1.15

Group Two's Video Scores

Group 2	Gabriella	Michelle	Heather	Katie
Video contains a title, composers' names, no misspellings, and smooth transitions.	5/5	5/5	5/5	5/5
Video includes recorded song and an instrumental accompaniment.	5/5	5/5	5/5	5/5
Project was handed-in on the due date.	5/5	5/5	5/5	5/5
Combined group teamwork score.	17/20	18/20	19/20	14/20
Score	94%	96%	98%	88%

Table 1.16

Group Three's Video Scores

Group 3	Samantha	Amy	Elizabeth	Amber
Video contains a title, composers' names, no misspellings, and smooth transitions.	5/5	5/5	5/5	5/5
Video includes recorded song and an instrumental accompaniment.	5/5	5/5	5/5	5/5
Project was handed-in on the due date.	5/5	5/5	5/5	5/5
Combined group teamwork score.	19/20	20/20	20/20	18/20
Score	98%	100%	100%	96%

Table 1.17

Group Four's Video Scores

Group 4	Susan	Kristin	William	Ken
Video contains a title, composers' names, no misspellings, and smooth transitions.	5/5	5/5	5/5	5/5
Video includes recorded song and an instrumental accompaniment.	5/5	5/5	5/5	5/5
Project was handed-in on the due date.	5/5	5/5	5/5	5/5
Combined group teamwork score.	20/20	20/20	14/20	16/20
Score	100%	100%	88%	92%

With the presentations finished and the project completed, I asked the students to complete one more exit slip. This time students were asked to finish the statement, “This project made me feel...”

Group One’s comments included...

- Timothy: “I think it was an amsome project because it was fun to work with [*sic*].”
- Anthony: “the same, because it is just another project, but it was a little more fun, than a regular project [*sic*].”
- Tracey: “I liked this project a lot. I liked getting to make a video, that was cool. I would definetly keep this project for future 8th graders to do [*sic*].”
- Eric: “good because it was a lot more fun and interesting without a bunch of paper work [*sic*].”
- Katrina: “Happy? because it feels good to see the final product [*sic*].”

Group Two’s comments included...

- Gabriella: “It made me feel a little annoyed because it was a difficult process and things didn’t warcs [*sic*] sometimes.”
- Michelle: “I liked this project I wish we could of just picked a soung and made a video [*sic*].”
- Katie: “It was alright it should been better I don’t know but it should have been BeTTER [*sic*].”

- Heather: “like creating a song is a lot more difficult than I thought [*sic*].”

Group Three’s comments included...

- Elizabeth: “happy. It was good experience. Had fun editing and filming [*sic*].”
- Amy: “It was fun; a lot of tech difficulties, but such a cool experience ☺ [*sic*].”
- Samantha: excited because it was really cool...and it was a lot of fun [*sic*].”
- Amber: “happy that it’s over. Although it was fun, just a lot of work [*sic*].”

Group Four’s comments included...

- Ken: “Kinda bored because I have to do a lot of work with music and drums at home because my dad wants me to be great at drums [*sic*].”
- William: “good it’s fun and easier than the keyboards from last year [*sic*].”
- Susan: “At times it was frustrating because we didn’t pick the people in our group. The technology was annoying but the project in general was fun.”
- Kristin: “good because it is done. But crazy when we were working on it. It was a really fun Project [*sic*]!”

Post-Test Given

Now that the project was finished, I needed to administer the post-test to determine if the students' knowledge of music concepts had increased. Even though Gabriella and Tracey were not present for the pre-test, I still had them take the post-test in order to determine their understanding of music theory. However, Amy was not given the post-test because she withdrew from the school just a few days prior and I was not given advance notification.

After comparing the pre-test and post-test scores, it was determined that fourteen students' scores increased, one student's score remained the same, and one student's score decreased. Of the fourteen students whose score had increased, the greatest increase came from Samantha whose score went from a 19% to a 76%. Heather had the lowest increase with an 84% to an 88%. However, Heather already had a rather good understanding of music theory at the beginning of the project. The student who basically remained the same was Noel. He scored a 96% on the pre-test and a 95% on the post-test. Noel knew and understood music concepts prior to entering my classroom and participating in the project. The one student's whose score decreased was Katie. She went from a 20% to a 10%. Katie had an IEP and I was not sure as to why her score decreased. Many ideas came to my mind as to possible reasons for the decrease in score. For example, maybe she was having an off day when she took the post-test or maybe she made better guesses on the pre-test when she wasn't sure of an

answer. Finally, maybe the amount of music concepts used in the project was too much for her to grasp in such a short period of time. These were only guesses and I have remained unclear as to the cause of her decreased score. See Tables 1.18 for a comparison of pre-test and post-test scores.

I decided to look at the specific music concepts that were tested in the pre-test and post-test and compare scores. When comparing the pre-test and post-test scores and creating class averages for each, I did not include Gabriella's, Tracey's, and Amy's test scores since I only had one score for each student. The first item I compared was the class average on the test. The average score on the pre-test was a 49%. On the post-test, the average score increased to a 71.69%. Next, I compared the scores for each section of the test. I was curious as to whether there was an improvement in all music concepts or just some concepts.

The first section of the test was a matching section and it was designed to determine if students knew the names of notes and rests. On the pre-test, the average score for the class was 8.63 points out of twelve possible points. On the post-test, the average score increased to 10.19 points. I contributed this increase to both whole group instruction as well as the project. This was a concept that was taught as a whole group and it was vocabulary that students used while completing the project.

Table 1.18

A Comparison of Pre-Test and Post-Test Scores

	Pseudonym	Pre-Test Grade	Post-Test Grade	Amount Score Changed (By Percentage Points)
1.	Noel	96%	95%	- 1
2.	Gabriella		86%	
3.	Samantha	19%	76%	+ 57
4.	Eric	12%	66%	+ 54
5.	Elizabeth	42%	81%	+ 39
6.	Jack	15%	28%	+ 13
7.	Katie	20%	10%	- 10
8.	Anthony	78%	95%	+ 17
9.	Katrina	69%	93%	+24
10.	Tracey		79%	
11.	Kristin	54%	83%	+ 29
12.	Amy	34%		
13.	Michelle	59%	81%	+22
14.	Heather	84%	88%	+ 4
15.	Susan	75%	94%	+ 19
16.	Ken	21%	36%	+15
17.	Amber	65%	90%	+ 25
18.	William	59%	78%	+ 19
19.	Timothy	16%	53%	+ 37

Next, I reviewed the scores for rhythm syllables. The use of rhythm syllables was a method of instruction that was used to help students read rhythms accurately. If students knew the rhythm syllables, and they were able to keep a steady beat, then most students should have been able to read complicated rhythms with accuracy. Students scored an average of 1.13 points out of a possible eight points. This was not surprising to me, as most students do not retain their knowledge of rhythms syllables unless it is practiced on a regular basis. The post-test scores increased to 5.31 points. This concept was taught

during whole group instruction and students used rhythm syllables when determining the rhythms for their lyrics.

Time signature was the next concept that appeared in the tests. Students were given three rhythms that were four measures in length. Based upon their knowledge of notes and rests' beat values and their knowledge of time signatures, students had to determine the correct time signature for each rhythm. Thus, students had to determine the number of beats in each measure and decide if the rhythm was in $\frac{4}{4}$, $\frac{3}{4}$, or $\frac{2}{4}$ time. The pre-test average score was 1.53 points out of a possible three points. On the post-test, the average score was 1.47 points. That was a slight decrease. Upon the examination of the tests, I felt that the decrease was not due to a lack of understanding but to a lack of proper written formation of time signatures. More students on the post-test than on the pre-test wrote the time signatures as if they were fractions, a line between the numbers. This was inaccurate and I only gave them half credit for their correct answers if they added a line between the numbers.

Next, students' understanding of bar lines was tested. Students were given three examples of rhythms that had a time signature placed at the beginning. Students had to place bar lines based upon the time signature given. For example, if the time signature was $\frac{4}{4}$, then a bar line needed to be placed after every four

beats. Out of a possible three points, the students' average score was 0.83 points. The post-test showed an increase in the average score to a 1.38 points. Even though this concept was taught in a whole group setting, students had to really apply this knowledge when they were composing the rhythms for their lyrics. Students first wrote the rhythms for how they wanted to say their lyrics. Then they had to take those rhythms and determine the time signature and where to place the bar lines based upon the time signature chosen. Due to the importance and application of this concept, I had hoped and expected to see a larger increase in the score.

The reading of lines and spaces for students has always been a challenge during my sixteen years as a general music teacher. In particular, bass clef has always posed more of a challenge to my students than treble clef. I believe this has been because most students have had more experiences with reading treble clef than they have had with bass clef. Also, it has been a concept that if not used regularly then it was usually forgotten. I actually was pleasantly surprised when the students' average score for treble clef was 7.31 points out of a possible twelve points for treble clef lines and spaces. As expected, the students' average score for bass clef was slightly lower at 5.38 points. Still, it was not a bad score for a pre-test. Once again, this was a concept taught during whole group instruction but then applied during the project. Students were responsible for composing a melody and an understanding of lines and spaces was essential. Unfortunately,

due to time constraints, students never had the opportunity to compose a chordal harmony in bass clef. Thus, students applied their knowledge of treble clef but they did not have the opportunity to work and compose in bass clef. Not surprisingly, the students' average score for treble clef increased to 9.94 points out of a possible twelve points. I was very pleased with this score. My surprise came when I looked at the bass clef score. I expected it to increase because of whole group instruction but without the application process, I did not expect a large increase. I was mistaken because the average score increased to 9.63 points and this increase was not due to the implementation of the project. Interesting.

The final section of the test dealt with music analysis. Students were given eight measures from a pop song and they had to apply their understanding of tempo, dynamics, time signature, bar lines, measures, and double bar lines. I was not surprised when students scored an average score of 3.53 points out of a possible eight points. I had expected the scores to be low due to the number of students who did not play an instrument and thus did not use these concepts often. Once again, time constraints reeked havoc on my instructional plans. I very briefly discussed dynamics with my students but I was never able to teach about tempo. Consequently, I expected the scores to only marginally improve as a result of our study of time signatures, bar lines, and double bar lines. However, the scores did not increase but decreased. They went from a 3.53 to a 3.36. I was confused by this result since students were responsible for creating a finished

copy of their song that included a time signature, bar lines, and tempo. This result caused me to wonder if Finale Note Pad did too much of the thinking for my students. See Tables 1.19 and 1.20 for pre-test and post-test scores.

Exit Survey

On the last day of class I had students take an exit survey. This survey was completed anonymously because I wanted the students to be truthful in order to receive the most accurate data. Based upon the results of the survey, overall, the students felt positive about the project, the use of technology, and working in groups. More specifically, eleven students felt that the use of technology helped them to learn about music theory. Four students felt indifferent and only three students felt that the technology did not help them. In regards to the project, ten students felt that the project helped them to gain a better understanding of music theory. Seven students felt indifferent and only one student did not feel that the project helped.

One interesting result came about when discussing group work. When asked if they enjoyed working in groups, twelve students said yes, four were indifferent, and two said no. However, when asked if they felt that working in groups helped them to gain a better understanding of music theory, only eight said yes, four were indifferent, and six said no. Thus, overall, students liked working in groups but a large portion of the class felt that the groups did not help in their learning process.

Table 1.19

Pre-Test Scores by Concept

	Pseudonym	Pre-Test Grade	Notes and Rests	Rhythm Syllables	Time Signature	Bar Lines	Treble Clef	Bass Clef	Music Analysis
1.	Noel	96%	10/12	8/8	1.5/3	3/3	12/12	12/12	7/8
2.	Gabriella								
3.	Samantha	19%	3/12	0/8	.5/3	0/3	5/12	0/12	2.5/8
4.	Eric	12%	3/12	0/8	0/3	0/3	2/12	1/12	1/8
5.	Elizabeth	42%	11/12	6/8	2.5/3	0/3	0/12	0/12	5/8
6.	Jack	15%	3/12	0/8	0/3	0/3	3/12	1/12	1.5/8
7.	Katie	20%	5/12	0/8	1.5/3	0/3	4/12	1/12	0/8
8.	Anthony	78%	12/12	0/8	3/3	3/3	11/12	12/12	4/8
9.	Katrina	69%	10/12	0/8	3/3	0/3	11/12	12/12	4/8
10.	Tracey								
11.	Kristin	54%	11/12	0/8	2/3	0/3	10/12	6/12	2.5/8
12.	Amy								
13.	Michelle	59%	12/12	0/8	1/3	0/3	12/12	4/12	5.5/8
14.	Heather	84%	12/12	1/8	1.5/3	3/3	12/12	12/12	7.5/8
15.	Susan	75%	12/12	0/8	3/3	1/3	11/12	12/12	4.5/8
16.	Ken	21%	8/12	0/8	1/3	0/3	0/12	0/12	3/8
17.	Amber	65%	12/12	3/8	3/3	3/3	12/12	0/12	4.5/8
18.	William	59%	8/12	0/8	1/3	0/3	11/12	12/12	2.5/8
19.	Timothy	16%	6/12	0/8	0/3	0/3	1/12	1/12	1.5/8
	Average	49.00%	8.63/ 12	1.13/8	1.53/3	.81/3	7.31/12	5.38/12	3.53/8

Table 1.20

Post-Test Scores by Concept

	Pseudonym	Pre-Test Grade	Notes and Rests	Rhythm Syllables	Time Signature	Bar Lines	Treble Clef	Bass Clef	Music Analysis
1.	Noel	95%	12/12	7/8	3/3	3/3	12/12	11/12	7/8
2.	Gabriella								
3.	Samantha	76%	10/12	7/8	1.5/3	0/3	12/12	12/12	1.5/8
4.	Eric	66%	10/12	4/8	.5/3	0/3	11/12	12/12	.5/8
5.	Elizabeth	81%	12/12	7/8	3/3	0/3	12/12	10/12	3/8
6.	Jack	28%	6/12	0/8	.5/3	0/3	4/12	5/12	1/8
7.	Katie	10%	2/12	0/8	0/3	0/3	3/12	1/12	0/8
8.	Anthony	95%	12/12	8/8	2/3	3/3	12/12	12/12	6/8
9.	Katrina	93%	12/12	7/8	1.3/3	3/3	12/12	12/12	6.5/8
10.	Tracey								
11.	Kristin	83%	12/12	7/8	1.5/3	2/3	12/12	11/12	2.5/8
12.	Amy								
13.	Michelle	81%	12/12	5/8	1.5/3	2/3	12/12	9/12	5.5/8
14.	Heather	88%	12/12	4/8	1.5/3	2/3	12/12	12/12	7.5/8
15.	Susan	94%	12/12	7/8	3/3	2/3	12/12	12/12	6.5/8
16.	Ken	36%	7/12	1/8	1.5/3	0/3	1/12	9/12	1.5/8
17.	Amber	90%	10/12	8/8	1.5/3	3/3	12/12	12/12	5.5/8
18.	William	78%	12/12	8/8	.5/3	0/3	11/12	11/12	2.5/8
19.	Timothy	53%	10/12	5/8	.5/3	2/3	9/12	3/12	1/8
	Average	71.69%	10.19 /12	5.31/8	1.47/3	1.38/3	9.94/12	9.63/12	3.36/8

When I read student responses regarding technology use, another interesting finding developed. When asked if they enjoyed using technology,

eleven students responded that they did, five students felt indifferent, and two stated that they did not like using technology. I next asked them if they liked the technology used in the project. I received an increase in favorable responses. Thirteen students stated that they did like the technology used, two were indifferent, and three did not like the technology used. See Table 1.21 for a specific breakdown of the responses.

The survey also asked students to write responses to certain questions. Students were asked what they liked about the project. I received the following responses.

- “Getting to use the computers and there was less paper work [*sic*].”
- “I liked being able to use the technology to create this project. I also liked making the music video.”
- “Garageband [*sic*].”
- “I liked the technology part, and filming.”
- “Garage band [*sic*].”
- “I like that we got to pick a person we wanted to work with [*sic*].”
- “It helped me understand how to make lyrics and melodies for songs.”
- “I like the technology because it was fun to work with.”
- “That we got to use the computers. And the cameras. also I liked working in groups [*sic*].”

Table 1.21

Exit Survey

	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree
When I first learned about the project (song and music video), I was excited.	2	4	4	8	0
The use of technology helped me to learn about music theory.	0	3	4	9	2
I feel that I have a better understanding of music theory after completing the project.	0	1	7	10	0
I felt motivated to complete this project.	0	3	7	6	2
• If yes, why?	4 Group work	7 Technology	2 Project	1 Other (Good Grade)	
• If no, why?	4 Group Work	3 Technology	4 Project	1 Other (Singing)	
I like working in groups.	0	2	4	9	3
Working in groups helped me to better understand music theory.	0	6	4	7	1
I like using technology (in general).	0	2	5	4	7
I liked using the technology needed for this project.	0	3	2	9	4
I liked working on this project.	2	0	9	6	1

- “You could use your creativity [*sic*]”
- “Garage band [*sic*]”
- “what I liked most about the project was that we were aloud to make our own song [*sic*].”
- There wasn’t a test or a bunch of paper work it was just your group and the computer [*sic*]”
- “I liked making the video for the project.”
- “I liked the end when you saw your music video and you thought, wow I can’t believe I made this [*sic*].”
- “using Garage band and writing the song [*sic*]”
- “groups [*sic*]”

After I read and reread these responses I felt that the project had many favorable aspects and that the students had a positive learning experience.

I next asked the students what they did not like about the project. I received the following responses.

- “I didn’t really like working in groups that much.”
- “Being in groups [*sic*]”
- “I didn’t like writing the song.”
- “group work [*sic*]”
- “We had to make a music video and present it to the class [*sic*].”

- “The technology got annoying sometime and working in a group was tough [*sic*].”
- “I did not like making the song.”
- “So [*sic*] people didn’t help at all.”
- “We had to present them [*sic*]”
- “I didn’t like the music writing. Like rythm and melody [*sic*]”
- It seemed like there wasn’t a lot of time.”
- “I didn’t like picking a poem, putting the lyrics on Finale, putting everything to a rhythm and melody in a few days, or the work to get each file on a new program.”
- “I did not like the singing part.”
- “we have to sing it [*sic*]”
- “singing [*sic*]”

Upon reading these responses from my students, I determined that there was definitely a split in the opinion of working in groups. Some students liked working in groups and others did not. I was not surprised that students expressed dissatisfaction in singing and presenting the project to the class. Middle school students have demonstrated self-consciousness and a concern for a positive peer opinion. Consequently, it was difficult for the students to play their songs and videos to their peers.

Finally, I asked the students what they would change about the project. I received the following responses.

- “Nothing [*sic*]”
- “Working alone, or maybe a group of two [*sic*].”
- “The poems we chose from [*sic*].”
- “Shouldn’t have to present if they don’t want to. More time for video [*sic*]”
- “The amount of time given. (more) [*sic*]”
- “Less group members [*sic*].”
- “whether or not you have to share [*sic*]”
- “I wouldn’t change anything [*sic*]”
- “Maybe start a little earlier so theres more time [*sic*].”
- “Almost everything that doesn’t involve the video in this project [*sic*].”
- “I would completely cut out the singing and find a program that would sing the words for us.”
- “having to sing it – maybe [*sic*]”

Once again, the same issues came to the forefront, groups, time, and singing.

Students felt that the groups should have been smaller in size and that more time should have been given for the project. Unfortunately, these concerns are out of my control. I have only six computers so groups cannot be smaller and the class only lasts one marking period so time cannot be extended. The other change that

students would have made involved the singing and presenting of the song. Project-based learning was founded on having an authentic learning experience as well as presenting the final project. Thus, I will not change the expectation that students sing their songs and present them to the class. However, I need to determine how I can make the singing and the presenting a more favorable experience for my students.

With the final survey, my action research study came to an end. Upon its completion, I spent time organizing my data and reflecting upon my journal in order to determine the themes that emerged. Using these themes as a focal point, I was then able to formulate my findings and support these findings using the data collected.

FINDINGS

Traditional instruction is needed prior to the implementation of project-based learning, in order to provide students with a foundational understanding of the necessary concepts needed to work through and complete the project.

In order for students to be able to successfully maneuver through and complete the project, students needed whole group instruction on several music concepts. The project did not provide an opportunity for students to learn about notes and rests nor lines and spaces but instead it was meant for the application of these concepts. Thus, several days were spent incorporating whole group instruction, a more traditional approach.

Based upon the information I gathered from my students on the first day of class, there were thirteen out of the nineteen students who had never previously played a music instrument. Even though these thirteen students had previously participated in general music classes, I have found that most students who do not play a musical instrument do not retain the knowledge learned in these classes because they were not actually applying their musical knowledge on a regular basis.

This belief was confirmed when I administered the pre-test and looked at the results. Eleven out of seventeen students scored a 60% or lower on the pre-test. Four students scored between a 61% and 80% and the remaining two

students who took the pre-test scored an 81% or higher. Students who had previously or were currently playing an instrument scored four of the top five scores on the pre-test.

Since the project required students to compose a rhythm based upon lyrics, students needed to have an understanding of notes, rests, beat values, time signatures, bar lines, and double bar lines. Also, due to the limited time frame, I had determined it was best for my students to spend approximately five days reviewing these musical concepts as a whole group.

When it came time for the students to compose a melody, once again I spent a few days reviewing how to read treble and bass clef lines and spaces. Since this concept was not as difficult to comprehend and since my students quickly demonstrated an understanding of lines and spaces, we only spent two days working on this concept as a whole group.

Working with the students and giving the fundamental knowledge needed to complete the project was essential. I gave the information about the concepts but it was the project that actually allowed them to apply these concepts in a authentic setting thus creating a meaningful learning experience for my students.

Based upon post-test scores, only four students scored below a 60% and of those four, three students' scores had increased. Two students scores were between 61% and 80% and now nine students scored 81% or higher. All but two students had increased scores. Of the two students who did not improve, one was

an IEP student who struggled academically and it did not surprise me that she still had difficulty understanding musical concepts. The other student's score stayed consistent. This did not surprise me either because on the pre-test he had scored a 96%. This score demonstrated a strong foundation in musical knowledge. Based upon the comparison of pre-test and post-test scores, I believe that the whole group instruction was necessary and it contributed to the success of the students and their gaining of content knowledge.

Teacher roles in project-based learning included: planning the project, creating rubrics to assess the projects, conferencing with student work groups, and providing help and/or mini lessons when needed.

As the teacher, I was responsible for creating a project that included a clear goal that was aligned with state and national standards. The goal of the project was for the students to gain a better understanding of music theory through the application of musical concepts while composing an original piece of music. Once the purpose was established, it was determined that the following standards were to be incorporated into the design of the project.

Music (Music World: The Educator's Best Friend, 1996)

Music Content Standard #4: Composing and arranging music within specified guidelines

- *Achievement Standard:* Students compose short pieces within specified guidelines (e.g., a particular style, form, instrumentation, compositional

technique), demonstrating how the elements of music are used to achieve unity and variety, tension and release, and balance

Music Content Standard #5: Reading and notating music

- *Achievement Standard:* Students use standard notation to record their musical ideas and the musical ideas of others

Music Content Standard #7: Evaluating music and music performances

- *Achievement Standard:* Students evaluate the quality and effectiveness of their own and others' performances, compositions, arrangements, and improvisations by applying specific criteria appropriate for the style of the music and offer constructive suggestions for improvement

Music Content Standard #8: Understanding relationships between music, the other arts, and disciplines outside the arts

- *Achievement Standard:* Students describe ways in which the principles and subject matter of other disciplines taught in the school are interrelated with those of music (e.g., language arts: issues to be considered in setting texts to music; mathematics: frequency ratios of intervals; sciences: the human hearing process and hazards to hearing; social studies: historical and social events and movements chronicled in or influenced by musical works)

Literacy - Writing-Types of Writing (Pennsylvania Department of Education, 2011)

1.4.8.A Write poems, short stories, and plays.

- Apply various organizational methods.
- Include **literary elements** and **devices**.

Technology (International Society for Technology in Education, 2007)

1. Creativity and Innovation

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:

- c. Apply existing knowledge to generate new ideas, products, and processes.
- d. Create original works as a means of personal or group expression.

2. Communication and Collaboration

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:

- a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environment and media.
- b. Create original works as a means of personal or group expression.

3. Technology Operations and Concepts

Students demonstrate a sound understanding of technology concepts, systems, and operations. Students:

- e. Understand and use technology systems
- f. Select and use applications effectively and productively.

- g. Troubleshoot systems and applications.
- h. Transfer current knowledge to learning of new technologies.

Having created a clear goal and linking that goal to state and national standards provided a valuable learning experience for the students.

Next, I needed to determine the type of product and/or products that the students would be required to create. In the case of this project, the students were actually required to submit three different products: the lyrics and rhythm, the finished song, and the music video. Not only was I responsible for determining the products but I also needed to create the rubrics that were to be used for assessment. Four separate rubrics were created to assess the three products: *Lyrics/Rhythm Rubric*, *Melody Rubric*, *Music Video Rubric*, and *Teamwork Rubric*. Now that the project was designed, my responsibilities shifted from planning to implementing.

During the implementation of the project, I needed to meet with each group on a regular basis to ensure that they were meeting the goals of the project and adhering to the allotted time frame. It was during these conferences that I was able to determine the needs of the groups. Based upon each group's needs, I was able to incorporate mini lessons that were beneficial to a group's progress and success.

Finally, when I was not meeting with the groups, I was available to provide support as needed. This included but was not limited to: help with music

concepts, help with group dynamics, and help with technology issues. So, even though students were working in groups to complete the project, my role as the educator was never passive.

The use of technologies such as: Finale Note Pad, Garageband, iPhoto, flip cameras, and iMovie motivated most students to remain on task, complete assignments, and have a positive attitude towards learning.

Prior to beginning the project with my students, I had observed on numerous occasions that in general, this particular class of students were unwilling to volunteer. Also, they interacted very little and showed a preference for individual work as opposed to group work. For the most part, they completed the work required of them, but it was completed with a lack of interest and enthusiasm. These observations led me to believe that the students did not have a positive attitude towards learning.

Once the project began and the use of technology was implemented, I observed a change in my students. Students began interacting and became much more social with one another. I witnessed my students working and for the most part, enjoying the work. Group Two and Group Four regularly took turns while using Finale Note Pad to compose their songs. I saw groups using Finale Note Pad not only to compose their songs but also as a practice tool for singing. They used the playback feature and sang along with it in preparation for the recording

of their song in GarageBand. Finale Note Pad became a valuable tool for the students during the composing process.

I found that students really like using GarageBand. All students participated in the creation of an accompaniment for their song. Students were taking turns listening to their songs and discussing which loops to include. The enthusiasm was not only towards their own song but also towards the other groups' songs as well. I often saw and heard students asking others to listen to their songs. I heard statements such as "That's cool." and "That's awesome." while working with GarageBand. This program truly motivated my students to complete the assignment.

I also witnessed this enthusiasm while students filmed and edited their music videos. Students were observed smiling and laughing while working. They demonstrated an interest in their own work as well as the work of their peers.

With the use of this technology, all students completed and submitted their lyrics and rhythm assignment, all but one student completed and submitted their melody assignment, and all students participated in and presented their music video.

Student involvement in the learning process was demonstrated through group discussions, participation, on-task behaviors, and completion of projects.

As stated earlier, at the beginning of the marking period students did not demonstrate any interest or enthusiasm for learning in music class. They participated very little and applied only minimal effort. However, once we began the project, the behaviors of my students began to change. While completing group work, I observed participation and discussions by group members and students asked for assistance, which demonstrated individual and group involvement in the learning process.

While students worked in groups, I heard multiple statements that demonstrated interest in the project as well as knowledge of the content being studied. At the beginning of the project, I heard a student state, “Sounds like a lot of work. I never did this before, but I think I will be good at it.” While students were creating their lyrics, I heard a group discussing AB form and deciding which phrases they wanted to use for their verses and for their refrain. While composing the rhythms, I had several groups ask for assistance. I also observed all groups discussing and composing rhythms. One group in particular was singing their lyrics while trying to figure out which notes and rests to use. Students were on task and working to complete their assignments.

In regards to group work on the computers, I observed groups taking turns so that all members contributed to the input of information into Finale Note Pad. I heard Group Three actually using music terminology while discussing their

project. Group One was listening to their song in GarageBand and Tracey was giving her opinions about the accompaniment. Finally, I heard a member from Group Five state, “Did you guys fix that. It skips the one beat.” All of these examples show that for the most part, groups were on task, they were participating, they were discussing the assignments, they were using music terminology, and they completed their work in the allotted time frame.

While project based-learning in a general music classroom may improve student understanding of music theory based upon pre-test and post-test data, student performance ability showed no comparable gains.

The data showed that student knowledge of music theory did increase after the completion of the project. However, student performance did not improve. During the project, students were asked twice to perform their song. The first time was when students were required to record using Moodle. The expectation was that the students were to rap their lyrics. The lyrics should have been spoken with a steady beat and based upon the rhythms composed. The scores on the rubrics showed that most students had difficulties with keeping a steady beat and speaking the lyrics using the rhythms they had composed. There was only one student who received a four out of five points and the remaining students received mostly threes and twos. This meant that most students were not able to keep a steady beat and that there were often three to six rhythm errors in the performance.

The second time that students were asked to perform was during the recording of their song into GarageBand. Even though the song was being played during the recording, most students still were not able to sing the rhythms accurately and most students were not able to sing the correct pitches. Many factors could have contributed to their difficulties. However, there was no definitive reason as to why students were experiencing these problems. Consequently, based upon the project design, comprehension did improve but performance ability did not.

THE FUTURE

Upon reviewing the data collected and reflecting upon its meaning, I have decided to continue implementing project-based learning in my eighth grade general music classroom. However, based upon my findings, I realize that there are several adjustments that need to occur in regards to project design. Also, I realize that there are some difficulties that students are experiencing that are going to require further review and/or possible study.

The first change that I have already implemented is eliminating the recording of the lyrics into Moodle. I still believe that this expectation added an individual accountability to the lyrics and rhythm group product. However, due to limited technology access, I am unable to have enough computers to truly make this expectation a reality. I only have six computers in my classroom and the laptop carts are often signed out. Without enough computers, it just is not feasible to continue with this expectation.

The second reason, I have eliminated the Moodle recording is that the students were experiencing difficulties in correctly reading their lyrics rhythmically. I need to find a way that I can help my students be more successful with this assignment. I am left with numerous questions in regards to this issue. Why are students having difficulties reading rhythms accurately? What skills are the students learning in their elementary general music classes? Do rhythm syllables help students read rhythms accurately? Would implementing more

whole group and small group performance based activities in sixth and seventh grade help achieve greater rhythm accuracy in eighth grade? Should I help each group practice their song? These are some questions that I need to consider. Consequently, there is no easy answer or a quick fix to this problem. It is an issue that might require a future research study.

A second change that I have already made is to the *Lyrics/Rhythm Rubric*. In order to prevent the amount of capitalization and punctuation errors that previously occurred, this expectation has now been added to the rubric. Since I first correct their lyrics prior to them using Finale Note Pad, there is no reason for the amount of errors that are occurring. Students need to proofread their work. Plus, proper capitalization and punctuation is expected from eighth grade students.

A third change that I hope to implement in the future is the incorporation of music careers that can be linked with composing, recording, filming, and editing. So many times, students think that the only careers in music are teacher and performer yet there are many other possibilities for students who have a desire to work in the music industry. Possible career choices could be: lyricist, composer, arranger, producer, publisher, recording engineer, studio manager, and sound technician. I believe the addition of this component would greatly enhance the project and would be very valuable to the students. Each marking period that I implement this project, it becomes better. I learn from the previous marking

period and I make the necessary changes needed. Eventually, I hope to either weave the information regarding music careers into the project or discuss career information after the presentation of the music videos.

Overall, I believe that this is a very worthwhile project that challenges students, yet has achievable goals. However, I have two other areas of concern in regards to this project. The first is that this project did not help the student who had an IEP and I don't know why. This project has differentiation built into its design. There is whole group as well as small group instruction. The project uses both aural and oral skills. Concepts are reinforced through a variety of sources including worksheets, online tutorials, and online music games. The project is broken down into three stages in order to help students not feel overwhelmed. In regards to the multiple intelligences, it includes the following intelligences: musical, interpersonal, intrapersonal, linguistic, logical-mathematical, and bodily-kinesthetic. Conferences, mini-lessons, and one-on-one instruction are all incorporated. Many questions remain. Why did this project not help the one student who had an IEP? Is the project too overwhelming for IEP students? Is too much information being presented in too short of a period of time for a student with an IEP? Depending upon a student's individual needs, would this project help some IEP students? Of course, it is difficult to determine any answers to these questions because not enough information is available based upon my study. I would need to conduct a study that involved more IEP students.

The second area of concern I have is individual accountability. Even though I observe all students participating in the project, there are inevitably groups in which some students do much more work than other group members. I use a teamwork rubric that is incorporated into the final grade but I don't feel that this is enough. I also try to have group multi-tasking to ensure that all members are working. For example, while some students are working on the melody, the other group members can be mapping out the video. After a while, the members should switch tasks so that all members have experience with all aspects of the project. However, I still believe that at times an imbalance exists. This is an issue that I really need to reflect upon in order to determine how to weave individual accountability into each stage of the project.

Even though my action research study is finished, the information I have learned will continue to effect me as an educator and as a general music teacher. I have gained insight into the needs of some students. I have gained a better understanding of project-based learning with the implementation of technology, which will help me to improve my teaching practices and I have learned that there are still areas of concern that may require future action research.

REFERENCES

- Bartscher, K., Gould, B., & Nutter, S. (1995). Increasing student motivation through project-based learning. Master's Research Project. Saint Xavier University and IRI/Skylight. (ERIC ED 392 549).
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House*, 83, 39-43.
- Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist*, 26(3 & 4), 369-398.
- ChanLin, L. (2008). Technology integration applied to project-based learning in science. *Innovations in Education and Teaching International*, 45(1), 55-65.
- Costa, A. & Kallick, B. (2009). *The institute for habits of the mind*. Retrieved from <http://www.instituteforhabitsofmind.com/what-are-habits-mind>.
- Dewey, J. (1997). *Experience & education*. New York, New York: Touchstone.
- Doppelt, Y. & Barak, M. (2002). Pupils identify key aspects and outcomes of a technological learning environment. *The Journal of Technology Studies*, 28(1), 22-28.

- Eder, D. & Fingerson, L. (2002). Interviewing children and adolescents. In J. Gubrium & J. Holstein (Eds.), *Handbook of interview research: Context and method* (pp. 181-201). Thousand Oaks, CA: Sage.
- Education World: The Educator's Best Friend. (1996). *National Music Standards*. Retrieved from http://www.educationworld.com/standards/national/arts/music/5_8.shtml.
- Fleming, D. (2000). *A Teacher's Guide to Project-Based Learning*. Charleston, WV: AEL, Inc.
- Grant, M. M. (2002). Getting a grip on project-based learning: Theory, cases and recommendations. *Meridian: A Middle School Computer Technologies Journal*, 5(Winter). Retrieved March 10, 2010 from www.ncsu.edu/meridian/win2002/514/.
- Grant, M. M. & Branch, R. M., (2005). Project-based learning in a middle school: Tracing abilities through the artifacts of learning. *Journal of Research on Technology in Education*, 38(1), 65-98.
- Hendricks, C. (2009). *Improving schools through action research*. New Jersey; Pearson Education, Inc.
- Hernandez-Ramos, P., and De La Pez, S. (2009). Learning history in middle school by designing multimedia in a project-based learning experience. *Journal of Research on Technology in Education*, 42(2), 151-173.

- International Society for Technology in Education. (2007). *NETS for Students 2007*. Retrieved from <http://www.iste.org/standards/nets-for-students/nets-student-standards-2007.aspx>.
- Lowther, D., Inan, F., Strahl, J., & Ross, S. (2008). Does technology integration “work” when key barriers are removed? *Educational Media International* 45(3), 195-213.
- Markham, T., Larmer, J., & Ravitz, J. (2003). *Project based learning handbook: A guide to standards focused project based learning for middle and high school teachers*. Hong Kong: QuinnEssentials Books and Printing, Inc.
- Mergendoller, J. R. & Thomas, J. W. (2000). Managing project based learning: Principles from the field. Paper presented at the Annual Meeting of the American Education Research Association, New Orleans. Retrieved on March 5, 2010 from www.bie.org/research/study/principles_from_the_field.
- Mioduser, D., & Betzer, N. (2007). The contribution of project-based-learning to high-achievers’ acquisition of technological knowledge and skills. *International Journal of Technology Design Education*, 18. 59-77.
- Pennsylvania Department of Education. (2011). *State Academic Standards*. Retrieved from http://www.portal.state.pa.us/portal/server.pt/community/state_academic_standards/19721.

- Pulkkinen, J. (2003). The paradigms of e-education: An analysis of the communication structures in the research on information and communication technology integration in education in the years 2000-2001. Oulu University Library. Retrieved on February 1, 2011 from <http://herkules.oulu.fi/isbn9514272463/html/x321.html>.
- Savage, J. (2005). Information communication technologies as a tool for re-imagining music education in the 21st century. *International Journal of Education & the Arts*, 6(2). Retrieved on April 20, 2010 from www.ijea.org/v6n2/index.html.
- Silver, H. F., Strong, R. W., & Perini, M. J. (2000). *So each may learn: Integrating learning styles and multiple intelligences*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Tomlinson, C. A. & McTighe, J. (2006). *Integrating differentiated instruction: Understanding by design*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wing-Yi Cheng, R., Lam, S., & Chung-Yan Chan, J. (2008). When high achievers and low achievers work in the same group: The roles of group heterogeneity and processes in project-based learning. *British Journal of Educational Psychology*, 78(2), 205-221.

Yamzon, A. (1999). An examination of the relationship between student choice in project-based learning and achievement. College Research Document. Dominion College. (ERIC ED 430940).

APPENDICES

Appendix A: HSIRB Approval Letter



MORAVIAN COLLEGE

August 16, 2010

Meagan E. Tucker
2847 Edgemont Drive
Allentown, PA 18103

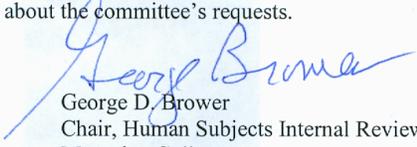
Dear Meagan E. Tucker:

The Moravian College Human Subjects Internal Review Board has accepted your proposal: "Technology Integrated Project-Based Learning" Given the materials submitted, your proposal received an expedited review. A copy of your proposal will remain with the HSIRB Chair.

Please note that if you intend on venturing into other topics than the ones indicated in your proposal, you must inform the HSIRB about what those topics will be.

Should any other aspect of your research change or extend past one year of the date of this letter, you must file those changes or extensions with the HSIRB before implementation.

This letter has been sent to you through U.S. Mail and e-mail. Please do not hesitate to contact me by telephone (610-861-1379) or through e-mail (browerg@moravian.edu) should you have any questions about the committee's requests.


George D. Brower
Chair, Human Subjects Internal Review Board
Moravian College
610-861-1379

Appendix B: Principal Consent Form

April 5, 2010

Dear Suzanne,

I am enrolled at Moravian College and am working towards a Master's Degree in Curriculum and Instruction. Currently, I am taking the course *Reflective Practice Seminar* in order to help me to become an even more effective teacher.

This class requires me to conduct a systematic study of my own teaching practices. The focus of my research is to determine if the implementation of technology in a project-based learning environment increases students' understanding of music theory. By doing this research, I hope to improve my students' music reading skills as well as gain an understanding and appreciation for music composition. My goal is to help all students achieve greater academic success.

Throughout the months of September through December, I will be gathering information to support my study through the use of pre-tests and post-tests, exit slips, surveys, student work samples, and observation. The collection of this data will be used to help me determine how I can best meet the needs of my students in order to improve their academic achievement. Throughout the study, all the students' names will be kept confidential as well as the name of the school. No names will appear on work samples or in reports of my study. Only my name, the name of my professor, and Moravian College will appear in the study. In order to ensure confidentiality, all research materials will be kept in a secure location and will be destroyed at the conclusion of the study.

All students will receive the same instruction, the same assignments, and the same commitment from me as their general music teacher. Participation in this study is voluntary and will not affect the student's grade in any way. A student who has chosen to participate may withdraw from the study at any time by writing me a letter or sending me an email. If a student is withdrawn, or the parent or guardian chooses not to have his or her child participate in the study, I will not use any information pertaining to that particular student in my study and the student will not be penalized in any way.

If you should have any questions or concern, please feel free to talk with me, or you may contact my professor at Moravian College. His name is Dr. Joseph Shosh and he may be contacted by phone at 610.861.1482 or by email at jshosh@moravian.edu. If you have no questions, please complete the bottom portion of this letter and return the form to me.

Thank you for all your help and support.

Sincerely,
Megan E. Tucker

I attest that I am the principal of the teacher conducting this research study, that I have read and understood this consent form, and that I have received a copy. Megan Tucker

_____ has my permission _____ does not have my permission

to conduct this study.

Principal's Signature: _____ Date: _____

Appendix C: Student Consent Form

September 7, 2010

Dear Parents or Guardians,

I am enrolled at Moravian College and am working towards a Master's Degree in Curriculum and Instruction. Currently, I am taking the course *Reflective Practice Seminar* in order to help me to become an even more effective teacher.

This class requires me to conduct a systematic study of my own teaching practices. The focus of my research is to determine if the implementation of technology in a project-based learning environment increases students' understanding of music theory. By doing this research, I hope to improve my students' music reading skills as well as gain an understanding and appreciation for music composition. My goal is to help all students achieve greater academic success.

Throughout the months of September through December, I will be gathering information to support my study through the use of pre-tests and post-tests, exit slips, surveys, student work samples, and observation. The collection of this data will be used to help me determine how I can best meet the needs of my students in order to improve their academic achievement. Throughout the study, all the students' names will be kept confidential as well as the name of the school. No names will appear on work samples or in reports of my study. Only my name, the name of my professor, and Moravian College will appear in the study. In order to ensure confidentiality, all research materials will be kept in a secure location and will be destroyed at the conclusion of the study.

All students will receive the same instruction, the same assignments, and the same commitment from me as their general music teacher. Participation in this study is voluntary and will not affect the student's grade in any way. A student who has chosen to participate may withdraw from the study at any time by writing me a letter or sending me an email. If a student is withdrawn, or the parent or guardian chooses not to have his or her child participate in the study, I will not use any information pertaining to that particular student in my study and the student will not be penalized in any way.

If you should have any questions or concern, please feel free to talk with me, or you may contact my professor at Moravian College. His name is Dr. Joseph Shosh and he may be contacted by phone at 610.861.1482 or by email at jshosh@moravian.edu. If you have no questions, please complete the bottom portion of this letter and return the form to me by **Wednesday, September 8, 2010**.

Thank you for all your help and support.

Sincerely,
Megan E. Tucker

My child, _____

_____ has my permission _____ does not have my permission

to participate in this study.

Parent / Guardian Signature: _____ Date: _____

Appendix D: Pre-Test

Name: _____ Class Period: _____
Score _____/58

**Pre-Test
Grade 8**

Notes and Rests (_____ 12 pts)

Directions: Match the note or rest to its name by writing the **CAPITAL LETTER** on the line next to the note or rest.

- | | | | |
|-----|-------|---|---------------------|
| 1. | _____ |  | A. Whole Note |
| 2. | _____ |  | B. Whole Rest |
| 3. | _____ |  | C. Dotted Half Note |
| 4. | _____ |  | D. Half Note |
| 5. | _____ |  | E. Half Rest |
| 6. | _____ |  | F. Quarter Note |
| 7. | _____ |  | G. Quarter Rest |
| 8. | _____ |  | H. 1 Eighth Note |
| 9. | _____ |  | I. 2 Eighth Notes |
| 10. | _____ |  | J. Eighth Rest |
| 11. | _____ |  | K. Sixteenth Note |
| 12. | _____ |  | L. Sixteenth Rest |

Rhythm Syllables (_____ 8 pts)

Directions: Write the *rhythm syllables* under the notes and rests.

1. $\frac{4}{4}$ 

2. $\frac{4}{4}$ 

Time Signatures (_____ 3 pts)

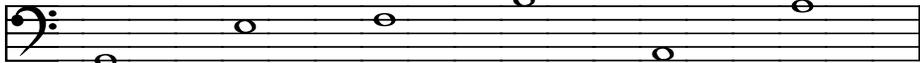
Directions: Write the correct time signature in the box. The answer will be $\frac{2}{4}$,

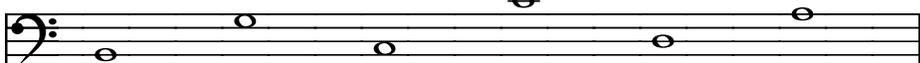
$\frac{3}{4}$, or $\frac{4}{4}$.

Bass Clef (_____ 12 pts)

Directions: Using CAPITAL LETTERS, write the correct letter name under each note.

1. 

2. 

Music Analysis (_____ 8 pts)

Directions: Answer the questions based of the following piece of music.

Teardrops On My Guitar

Taylor Swift

Moderato



He's the reason for the teardrops on my guitar, the only thing that keeps me wishin' on a wishin' star.

He's the song in the car. I keep sing - in'. Don't know why I do.

1. What is the time signature in the song, “Teardrops on My Guitar?” _____
2. How many measures are in the song? _____
3. Draw a circle around all the bar lines.
4. Draw a triangle around the double bar line.
5. What is the tempo for the song? _____
6. What does that tempo mean? _____
7. What dynamic marking is in the song? _____
8. What does that dynamic marking mean? _____

Appendix E: Post-Test

Name: _____ Class Period: _____
Score _____/58

**Post Test
Grade 8**

Notes and Rests (_____ 12 pts)

Directions: Match the note or rest to its name by writing the **CAPITAL LETTER** on the line next to the note or rest.

- | | | | |
|-----|-------|---|---------------------|
| 1. | _____ |  | A. Whole Note |
| 2. | _____ |  | B. Whole Rest |
| 3. | _____ |  | C. Dotted Half Note |
| 4. | _____ |  | D. Half Note |
| 5. | _____ |  | E. Half Rest |
| 6. | _____ |  | F. Quarter Note |
| 7. | _____ |  | G. Quarter Rest |
| 8. | _____ |  | H. 1 Eighth Note |
| 9. | _____ |  | I. 2 Eighth Notes |
| 10. | _____ |  | J. Eighth Rest |
| 11. | _____ |  | K. Sixteenth Note |
| 12. | _____ |  | L. Sixteenth Rest |

Rhythm Syllables (_____ 8 pts)

Directions: Write the *rhythm syllables* under the notes and rests.

1. $\frac{4}{4}$ 

2. $\frac{4}{4}$ 

Time Signatures (_____ 3 pts)

Directions: Write the correct time signature in the box. The answer will be $\frac{2}{4}$, $\frac{3}{4}$, or $\frac{4}{4}$.

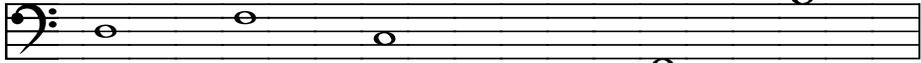


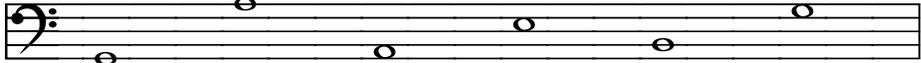




Bass Clef (_____ 12 pts)

Directions: Using CAPITAL LETTERS, write the correct letter name under each note.

1. 

2. 

Music Analysis (_____ 8 pts)

Directions: Answer the questions based of the following piece of music.

If I Ain't Got You

Alicia Keys

Allegro

Some peo - ple want it all, but I don't want noth-in' at all

If it ain't you, ba - by, if I ain't got you - ba - by.

1. What is the time signature in the song, "If I Ain't Got You?" _____
2. How many measures are in the song? _____
3. Draw a circle around all the bar lines.
4. Draw a triangle around the double bar line.
5. What is the tempo for the song? _____
6. What does that tempo mean? _____
7. What dynamic marking is in the song? _____
8. What does that dynamic marking mean? _____

Appendix F: Lyrics/Rhythm Rubric

Lyrics/Rhythm Rubric

Your Name: _____

DUE DATE: _____

Group Members: _____

Score: _____ / 100

Directions: Every student is to hand-in his/her completed song with this rubric by the due date.

Category	5	4	3	2	1	Score
Lyrics: Form	Lyrics are written in AB form with a minimum of three verses. Lyrics are divided accurately into syllables and there is at least one note per syllable.	Lyrics are written in AB form with two verses. All words are divided accurately into syllables but there is not at least one note per syllable.	Lyrics are written in AB form with one verse. There are one or two syllable division errors.	Lyrics are not in AB form. Lyrics include at least three verses. There are three or four syllable division errors.	Lyrics are not in AB form. Lyrics include two or fewer verses. There are five or more syllable division errors.	3 x ____ = (15)
Lyrics	Lyrics are divided accurately into syllables and there is at least one note per syllable.	All words are divided accurately into syllables but there is not at least one note per syllable.	There are one or two syllable division errors.	There are three or four syllable division errors.	There are five or more syllable division errors.	2 x ____ = (10)
Rhythms	A minimum of five different notes and/or rests are used.	Four different notes and/or rests are used.	Three different notes and/or rests are used.	Two different notes and/or rests are used.	One note was used.	2 x ____ = (10)
Technology Use: Finale Note Pad	Student used Finale Note Pad to create his/her final copy. All elements are included: title, composers' names, tempo, and lyrics.	Student used Finale Note Pad to create his/her final copy. One of the following elements is missing: title, composers' names, tempo, and lyrics.	Student used Finale Note Pad to create his/her final copy. Two or more of the following elements are missing: title, composers' names, tempo, and lyrics.	Student did not use Finale Note Pad to create his/her final copy.	Student did not hand-in a completed copy of his/her song.	4 x ____ = (20)
Performance: Recorded Using Moodle	Student recorded his/her song using Moodle.	Student recorded his/her song using Moodle.	Student recorded his/her song using Moodle.	Student recorded his/her song using Moodle.	Student did not record his/her song using Moodle.	2 x ____ = (10)
Performance: Recorded Accuracy	Performance had a steady beat and all rhythms were accurate.	Performance had a steady beat with one or two rhythm errors.	Performance had mostly a steady beat with three or four rhythm errors.	Performance did not have a steady beat and had five or six rhythm errors.	Performance did not have a steady beat and had seven or more rhythm errors.	4 x ____ = (20)
Due Date	Project is handed in on the due date.	Project is handed in 1 day late.	Project is handed in 2 days late.	Project is handed in 3 days late.	Project is handed in 4 or more days late.	3 x ____ = (15)

Appendix G: Melody Rubric

Melody Rubric

Your Name: _____ **DUE DATE:** _____

Group Members: _____ **Group Number:** _____

Directions: Every student is to hand-in his/her completed song with this rubric by the due date.

Category	5	4	3	2	1	Score
Melody	Verses and/or refrain have a melodic tune and each verse and/or refrain begins and ends on "C."	Verses and/or refrain have a melodic tune but one section does not begin and/or ends on "C."	Verses and/or refrain have a melodic tune but two sections do not begin and/or ends on "C."	Verses and/or refrain have a melodic tune but three or more sections do not begin and/or ends on "C."	Neither the verse(s) nor the refrain has a melodic tune.	4 x ___ = (20)
Technology Use: Finale Note Pad	Student used Finale Note Pad to create his/her final copy. All elements are included: title, composers' names, melody, tempo, dynamic markings, and lyrics.	Student used Finale Note Pad to create his/her final copy. One of the following elements is missing: title, composers' names, melody, tempo, dynamic markings, and lyrics.	Student used Finale Note Pad to create his/her final copy. Two of the following elements are missing: title, composers' names, melody, tempo, dynamic markings, and lyrics.	Student used Finale Note Pad to create his/her final copy. Three of the following elements are missing: title, composers' names, melody, tempo, dynamic markings, and lyrics.	Student used Finale Note Pad to create his/her final copy. Four or more of the following elements are missing: title, composers' names, melody, tempo, dynamic markings, and lyrics.	3 x ___ = (15)
Lyrics	All lyrics are properly hyphenated and capitalized. Proper punctuation is used. Project is handed in on the due date.	Lyrics are properly hyphenated and capitalized. Proper punctuation is used. Only 1 or 2 errors. Project is handed in one day late.	Lyrics are hyphenated and capitalized. Punctuation is used. 3 or 4 errors. Project is handed in two days late.	Lyrics are hyphenated and capitalized. Punctuation is used. 5 or 6 errors. Project is handed in three days late.	Lyrics are hyphenated and capitalized. Punctuation is used. 7 or more errors. Project is handed in four or more days late.	2 x ___ = (10)
Due Date	Project is handed in on the due date.	Project is handed in one day late.	Project is handed in two days late.	Project is handed in three days late.	Project is handed in four or more days late.	1 x ___ = (5)

Song Score: / 50

Appendix H: Music Video Rubric

Music Video Rubric

Your Name: _____ **DUE DATE:** _____

Group Members: _____

Directions: Each group will present their video by the due date.

Category	5	4	3	2	1	Score
Video Elements	Video contains a title, composers' names, no misspellings, and smooth transitions.	Video contains a title, composers' names, and smooth transitions with misspellings.	Video is missing one element.	Video is missing two elements.	Video is missing three elements.	3 x ____ = ____ (15)
Song Elements	Video includes recorded song and an instrumental accompaniment.				Song includes either the recorded song or an instrumental accompaniment.	2 x ____ = ____ (10)
Due Date	Project is handed in on the due date.	Project is handed in one day late.	Project is handed in two days late.	Project is handed in three days late.	Project is handed in four or more days late.	1 x ____ = ____ (5)
Teamwork	Combined group score.					____/20

Song Score: ____ / 50

Appendix I: Teamwork Rubric

Teamwork

Evaluator's Name (Your Name): _____

Peer's Name: _____

CATEGORY	4	3	2	1
Attitude	Never is publicly critical of the project or the work of others. Always has a positive attitude about the task(s).	Rarely is publicly critical of the project or the work of others. Often has a positive attitude about the task(s).	Occasionally is publicly critical of the project or the work of other members of the group. Usually has a positive attitude about the task(s).	Often is publicly critical of the project or the work of other members of the group. Often has a negative attitude about the task(s).
Contributions	Routinely provides useful ideas when participating in the group discussion. A definite leader who contributes a lot of effort.	Usually provides useful ideas when participating in the group discussion. A strong group member who tries hard!	Sometimes provides useful ideas when participating in the group discussion. A satisfactory group member who does what is required.	Rarely provides useful ideas when participating in the group discussion. May refuse to participate.
Quality of Work	Provides work of the highest quality.	Provides high quality work.	Provides work that occasionally needs to be checked/redone by other group members to ensure quality.	Provides work that usually needs to be checked/redone by others to ensure quality.
Preparedness	Brings needed materials to class and is always ready to work.	Almost always brings needed materials to class and is ready to work.	Almost always brings needed materials but sometimes needs to settle down and get to work	Often forgets needed materials or is rarely ready to get to work.
Working with Others	Almost always listens to, shares with, and supports the efforts of others. Tries to keep people working well together.	Usually listens to, shares, with, and supports the efforts of others. Does not cause "waves" in the group.	Often listens to, shares with, and supports the efforts of others, but sometimes is not a good team member.	Rarely listens to, shares with, and supports the efforts of others. Often is not a good team player.

Total Score: /20

Appendix J.3: Exit Slip-Technology Resources

Exit Slip

Describe your experiences with the online tutorials, vodcasts, web sites, games, etc. that you have been using to learn about rhythm. Discuss likes, dislikes, what needs to be improved, what should stay the same, and anything else you would like to share. Use the back of the paper if you need more room.

Appendix J.4: Exit Slip-Rhythm

Name: _____ Class Period: _____

Exit Slip

Composing a rhythm is like...

Appendix J.5: Exit Slip-Group Dynamics

Name: _____ Class Period: _____

Exit Slip

Discuss how your group is working. Include strengths, weaknesses, problems, etc. Please include if a teacher intervention is needed to help resolve a problem.

Appendix J.6: Exit Slip-Technology

Name: _____ Class Period: _____

Exit Slip

Using technology makes me feel...

Appendix J.7: Exit Slip-Project

Name: _____ Class Period: _____

Exit Slip

This project makes me feel...

Appendix K: Final Survey

Project Survey

1. When I first learned about the project (song and music video), I was excited.

Strongly Disagree 1 Disagree 2 Indifferent 3 Agree 4 Strongly Agree 5

2. The use of technology helped me to learn about music theory.

Strongly Disagree 1 Disagree 2 Indifferent 3 Agree 4 Strongly Agree 5

3. Which application helped you the most to learn about music theory?

Vodcasts
 Online Tutorials
 Online Games

4. Which application helped you the least to learn about music theory?

Vodcasts
 Online Tutorials
 Online Games

5. I feel that I have a better understanding of music theory after completing the project.

Strongly Disagree 1 Disagree 2 Indifferent 3 Agree 4 Strongly Agree 5

6. I felt motivated to complete this project.

Strongly Disagree 1 Disagree 2 Indifferent 3 Agree 4 Strongly Agree 5

• If yes, why?

Group Work Technology Project Other _____

• If no, why?

Group Work Technology Project Other _____

7. I like working in groups.

Strongly Disagree 1 Disagree 2 Indifferent 3 Agree 4 Strongly Agree 5

8. Working in groups helped me to better understand music theory

Strongly Disagree 1 Disagree 2 Indifferent 3 Agree 4 Strongly Agree 5

9. I like using technology (in general).

Strongly Disagree 1 Disagree 2 Indifferent 3 Agree 4 Strongly Agree 5

10. I liked using the technology needed for this project.

Strongly Disagree 1 Disagree 2 Indifferent 3 Agree 4 Strongly Agree 5

11. I liked working on this project.

Strongly Disagree 1 Disagree 2 Indifferent 3 Agree 4 Strongly Agree 5

12. What did you like about this project? _____

13. What didn't you like about this project? _____

14. What would you keep the same? _____

15. What would you change? _____
