Music in the classroom: Effects on student disposition and achievement

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ABSTRACT

Adolescents are faced with their own problems that school becomes a lower priority. Students are in need of a safe and comfortable environment, so they can learn. Music can be a tool used to create a more ideal learning environment by setting or changing the mood. Background music can be played during all classroom activities, lecture, individual work and cooperative groups. Nine case study students were chosen in each group, the control and the experimental. Pre and post surveys were conducted and compared to surveys taken after the study. Interviews provided an open-ended response to express student perspective. Inductive analysis provided an insight into student disposition in the classroom of the experimental group. Assignment and test scores, before and during the treatment, will be statistically analyzed (t-test) to observe any changes in student achievement. A comparison of the control and experimental group will be done as well to compare the two environments. More students appreciated the music the in the classroom after the treatment. Although a couple of students preferred to not have music in the classroom. The test and assignment scores did not show a statistical significance in showing achievement in the classroom. There was no statistical significance between the before and during scores for the experimental group. There was no statistical significance between the control and experimental groups during the treatment period.
CHAPTER I

INTRODUCTION

According to American Association for the Advancement of Science (1990), one of the purposes of education is to teach students to become responsible citizens. In order to become responsible and positive contributors to society, citizens need to understand themselves and the world they live in. The list of what citizens need to understand is endless; such as their health, ethics of technology, and the impact of everyday decisions to the environment are just some examples. In order for citizens to understand their world, they must be science literate.

Unfortunately, more and more American citizens are not becoming science literate. According to studies and tests that compare educational performance of all students across the world, American students rank close to the bottom in both science and mathematics (AAAS, 1990). As these tests were done in the past decades, the average performance of the American student had not improved. Countless recommendations have been given to the education field, but America is still falling short. Many foresee a bleak future for America.

In order to educate students to become science literate curriculum cannot be the only focus in reaching this goal. Motivation plays an important factor in a students’ success. A student needs to be ready and want to learn. Studies show that motivation declines during the middle grades, which in turn “defeat any major investment in schooling” (Anderman and Maehr, 1994, p.288). Anderman and Maehr (1994) cite that attitude towards school declines, as students get older. A lack in motivation is not just due to puberty, but also do the environmental facts. Trumper (1995) observed that the social scene is a major contributor as to why students learn and are successful in the science classroom. An academically challenging environment can be a detriment to many students because they find themselves comparing their abilities with their
peers. This prevents many students from acquiring the content. The challenge is not because they cannot learn the material, but because the students become frustrated and unmotivated (Stake and Mares, 2005).

A high school science teacher not only battles against time constraints, or the coverage of the standards, but also battle students’ attitude towards science. Many students have not been given the opportunity to explore science in their education. Sometimes students come into high school with a stigma against science. As adolescents get older, their lack of motivation increases, and is projected towards specific domains including science (Anderman and Maehr, 1994).

Educators need to understand the complexities of the brain. The brain can be changed and molded; depending on the stimuli it receives. We must continue to find ways to nurture our brains by enriching it with positive stimuli. The classroom should not be an exception. As educators, we have a responsibility in nurturing the brain. Removing negative threats and factors in the learning environment can help (Jensen, 1998, p.30). Without these threats, the brain can easily make neural connections, allowing the brain to grow and be enriched.

There are countless days when students are concerned about their personal life and it precedes any thoughts towards school. Educators can gather what we know about brain research and utilize it to the fullest. Teachers can attempt to remove all negative factors in the classroom and add positive stimulants as well. Music can be added in the classroom. It can create a specific type of mood, such as an upbeat mood, to a solemn and relax environment. Can the mood set in the classroom help students be successful? Can music create a learning environment?

Purpose

The purpose of this study was to observe the effectiveness of music in the science classroom. The specific questions were:
1. Does music improve and/or help student disposition in a science classroom?

2. What effect does music have on student achievement?

**Importance of the Study**

Music in the classroom was chosen as a topic because many people listen to music in order to set a specific tone or express their mood. If music helps individuals gain focus or reach a state of comfort, why not use it in the classroom as a strategy?

The research gathered will be valuable because this strategy can be applied to multiple disciplines and grade levels. Different kinds of music can be chosen, such as age appropriate and themed music. The study will demonstrate the importance of how the classroom environment affect a students’ social and emotional learning. With the pressures of high-stakes testing in all classrooms, students need a way to make learning more accessible. Teachers can utilize student’s emotional well-being in the classroom as a tool to approach and understand the content. Music will be advantageous to their learning. It is applicable to other subjects.

**Definition of Terms**

- **Background music** – music at low volumes in the classroom, helping the students to focus and stay calm.
- **Disposition** – individual moods, and ability to stay focus
- **Social and Emotional Learning (SEL)** – “The process through which children and adults develop the skills, attitudes, and values, necessary to acquire social and emotional competence” (Elias, Zins, Weissberg, Frey, Greenberg, Haynes, Kessler, Schwab-Stone, & Shriver et al 1997). Daniel Goleman (1995) of *Emotional Intelligence* refers to it as an important need to be “effective in all the critical domains of life, including school” (2).
Summary

A positive change in classroom environment can enhance learning. Music is a tool that can be used to improve environment. Studies have shown the effectiveness of a low-threatening environment to student disposition and achievement. Other areas of research, such as brain-based learning and multiple intelligences, support the importance of the social and emotional learning for students.
CHAPTER II

REVIEW OF THE LITERATURE

Music in the classroom was supported by ideas found in several areas of research: brain-based learning, multiple intelligences, social and emotional learning, and Mozart Effect. All these areas promoted the importance of music in the classroom.

Brain-Based Learning

Brain-based learning was a recently developed concept in education. McGreehan (2001) summarized the findings of brain research and how it can be utilized in the educational settings. Knowing how the brain works can empower educators in designing effective lessons and also improve students’ success in attaining the content. Emotions play a role in how students learn. When individuals feel threatened the body reacts accordingly. Therefore, learning is denied in the brain because individuals are busy reacting to the threat and negative situation. When the brain is at ease, it is then that the brain can acquire knowledge through experience (McGreehan, 2001).

An increase in positive stimulation creates not only more neurons in the brain, but the ability to understand more. Music is a means for the brain to be enriched. It serves as a positive stimulant because individuals react to music. Music primes the brain because it helps maintain the communication of its neurons, enhances creativity, and provides a positive attitude (Jensen, 1998, p.38).

Multiple Intelligences

Gardner’s theory of multiple intelligences suggests that individuals have different types of intelligences. Schools should not only focus on linguistic and logical intelligences. Curriculum needs to be diverse so every student’s strength can be met and challenged (Gardner, 1993). One
of the key ideas of multiple intelligences is that educators need to be aware of, not just two, but also all different types of intelligences (Kassell, 1998).

Glendale Community College has an initiative called “The Multiple Intelligence/Learning for Understanding (MI/LfU) in which students are given the opportunity to be creative and are provided imaginative learning options (Diaz-Lefebvre, 2004, p.49). Students were able to facilitate their own leaning and gain ownership of their knowledge. The content became personal and relevant rather than just memorized and regurgitated (McGreehan, 2001).

Jensen (1995) claims that 40% of our students are auditory learners. Music in the classroom affected students’ mood and behavior, which allows them to feel safe in their environment. “Music … has a positive, measurable, and lasting academic and social benefits” (Jensen, 1998, p.36). Jensen (1998) stated that the emotions music evoke help drive attention and create meaning (72). The use of music can teach students how to respond to musical sound, and to effectively use it (Brewer, 1995)

Understanding how to use music effectively in the classroom can help more students become successful. Having a nurturing place for student learning can improve the school and students’ performance for the high-stakes testing. Music can be used as a tool for success, not necessarily a tool for increasing IQ scores. It brings appreciation to an art and incorporates an effective use of music in everyday life (Jensen, 1998).

Social and Emotional Learning

A safe environment helps students to be ready to learn. The environment is not limited to the physical arrangement of the room, but also on the children’s well being. Teachers need to be aware of their students and their daily moods. Adolescents are usually more focused on their personal lives rather than their classes. When teachers are aware of their students’ well being, it
can be used as a classroom tool. When schools systemically pay attention to the social and emotional learning aspect of their students, there is an observed increase in academic achievement, a decrease in problem behaviors, and the quality of relationships that surrounds each student improves (Elias et al, 1997, p.1). Students become more involved with their learning. School becomes a personal experience where they can construct their own style of learning (Elias et al, 1997, p.19).

The emotional well-being of students can be integrated with the use of music. Humans have a physical response to music (Chalmers, Olson, & Zurkowski, 1999), stimulating our brain, setting the mood, and evoking emotion. Schools can create a learning environment by providing certain types of music to provoke a certain kind of mood. Chalmers et al. (1999) studied the Lozanov method of suggestology and found that “background music with softly spoken information … create[s] a relaxed yet concentrated state of mind conducive to absorbing information at a higher than average rate” (n.p.). It has been observed that playing music at 60 beats per minute provided a state of relaxation. Music affects the whole body: heart rate, posture, and emotion (Jensen, 1995, p.221). Types of music can set the tone, and “significantly affect the state of the learning… [then] of course, can affect the learning” (Jensen, 1998, p.37). Music helps with focus and attention (Jones, 2005).

Mozart Effect

The Mozart Effect, as cited in the 1993 study by Rauscher, Shaw, and Ky, “indicates that spatial-temporal abilities are enhanced after listening to music composed by Mozart” (Nantais & Schellenberg, 1999, p.370). The conclusion was reached based on an experiment, where a group of college students listened to Mozart’s work and before completing a spatial-reasoning task. These tasks were paper folding and cutting task and memory items. Students in the group with
Mozart’s music did much better than students with no music (Rauscher, Shaw, Levine, & Ky, 1994). As these findings were shared in the media, facts were distorted and misconceptions were made: listen to Mozart and become smarter (Cassity, Henley, & Markley, 2007; & Ivanov, 2003).

The major complaints of the study were that it was done in a controlled environment and the specificity of using Mozart music (Ivanov, 2003). Researchers wanted to replicate it and see it done in more realistic situations. The study was replicated with different types of stimuli, Schubert pieces were positive, while a narrative story by Stephen King (Nantais & Schellenberg, 1993) and “adagio by Albinoni, expected to induce low arousal and sad mood” (Thompson, Schellenberg, & Husain, 2001, p.248). Both of these studies showed were that significant improvements in scores were found in groups that received a positive stimulus, regardless of type, in comparison to groups who remained in a silent environment. The group that received a negative stimulus, the Albinoni piece, had lower scores in comparison to the silent group. Both studies concluded that preferences to the stimulus changed arousal and mood, which in turn influenced how a subject would perform in a specific task (Nantais & Schellenberg, 1993; Thompson et al., 2001). Arousal is defined “[how] music either increases or decreases the attentional neurotransmitters” (Jensen, 1998, p. 37).

As cited in many other works, changing the mood of the subject can significantly affect the cognitive performance. This effect was further studied with a video game. Subjects were observed as they played the game with the original soundtrack and changed to a Mozart piece. It was observed that subjects performed better when it was music they preferred listening to. Once again, performance was based on the arousal and mood of the subject (Cassity et al., 2007).
Music in the Classroom

Students’ ability to stay focus and learn the content is affected by many outside and environmental factors. Background music is a factor that teachers can easily manipulate and “hold potential for having an impact on student achievement” (Smith, & Davidson, 1991, p. 1). The misconception is that music makes an individual smarter (Cassity, Henley, & Markley, 2007; & Ivanov, 2003). What music can do is help with how one learns an idea (Demorest & Morrison, 2000). Music enhances learning because it “stimulates cognitive functioning” (Press, 2006). Music “activates students mentally, physically, and emotionally and create learning states which enhance understanding of learning material” (Brewer, 1995, n.p.). Music enriches the brain and makes learning more meaningful for the student. The student is stimulated and is able to focus more on a particular task (Brewer, 1995).

A study done by Hall in 1952 used background music in the classroom. It significantly improved reading comprehension for fifty-eight percent of the 245 students taking a reading test. The test concluded that the music helped with concentration (Hallam & Price, 1998). They also examined previous research done by Savan in 1996 where students were observed to be more calm and cooperative when music was used in the classroom. Hallam and Price (1998) pursued the same context and studied their students. Davidson and Powell (1986) observed that the use of easy-listening background music “was effective in increasing on-task-performance of children in an elementary science classroom” (p.32). As background or mood music can help aid some students, it may serve as a distraction for others (Press, 2006).

Music is not just a means to help with students focus, but it also has been studied to develop the mind (Jones, 2005).
Summary

Knowing how the brain works is important because educators can use it as a tool for success. Creating a safe environment for the brain allows it to work to its best potential (McGreehan, 2001). Music is a positive stimulus that causes the brain to react, activate cognitive functioning (Press, 2006) and enriches the brain this making learning more meaningful for the student (Brewer, 1995). When schools systemically pay attention to the social and emotional learning aspect of their students, there is an observed increase in academic achievement, a decrease in problem behaviors, and the quality of relationships that surrounds each student improves (Elias et al, 1997, p.1). Music is a useful tool in the education setting.
CHAPTER III
METHODOLOGY

The purpose of the study was to observe the effects of music on student disposition and in performance. Case study students were observed from the control and experimental group. A couple of tools were used to answer both questions. Student disposition was observed via surveys and interviews of the experimental group. Observing assignment and test scores of both experimental and control groups measured achievement.

Participants

The study took place in a public high school in the city of Alhambra, California. Two sections of ninth and tenth grade regular biology classes were selected. Students were randomly placed in classes determined by software used by the district. Both classes were heterogeneously mixed.

The control group had a total of 34 students – 13 females and 21 males. The ethnicity breakdown in the group was 62% Hispanic/Latino, 32% Chinese, 3% Hawaiian, and 3% White.

The treatment group had a total of 36 students – 21 females and 15 males. The ethnicity breakdown was 72% Hispanic, 8% Chinese, 8 % Vietnamese, 3% White, 3% Filipino, 3% African American, and 3% other Asian.

Nine case study students from each group were chosen based on their semester one grades (n=18). The case study students belonged in one of three groups: high, middle, and low. Six “high” students were chosen if their average was a B+ (87%) or higher. Six students with a B and C average (86% to 72%) were chosen as “middle” students. Six students with an average lower than C (71% or less) in the class was chosen as “low” students. Refer to table 1 to see the demographic breakdown of the two groups.
Table 1: Demographic Breakdown of Groups

The three groups of high, middle, and low were chosen so that all levels of students can be represented in the case studies. Comparisons can also be made not only amongst the same groups (i.e. high to high), but also across the groups (high to low, low to middle, etc). The averages assignment and test scores can have a similar in range. As the study progressed, one case study did not participate from both groups, due to not attending class on a daily basis. Both data sets were dropped and both groups had a total of eight students each.

Materials

A series of instrumental music compact discs were used as background music for my treatment group. The series was bought from Kagan Publishing where all the music has a tempo of 60 beats per minutes. According to research, the tempo of the music is important in setting what you want the brain to do and 60 beats per minute is prime for staying focus (Jensen, 2005). The series is organized in different compact discs, depending on the type of activity being done in the classroom, such as silent reading to lecture to cooperative projects. Although they have the same measure of beats, the kind of instrumental music is different.

There were two pre-surveys done. Survey 1 (refer to Appendix A) had both rating scale and open-ended questions. It had 15 first-person statements that concerned the students study habits and preference for work environment. Students had to rate themselves on a scale from 1 to 4, whether the statement was “very little like me” (1), or “a little like me” (2), or “like me” (3), or “a lot like me” (4). The open ended questions also pertained to the students preference in their
Music in the study habits and work environments. Survey 1A six open ended questions, in which three of the questions focused on their study environment at home and the other three focused on the classroom environment (refer to Appendix B).

Assignments were given to students on a daily basis. Three assignments were selected to represent the time before the treatment and three others to represent the time during the treatment. One of the assignments was a quick lab from the textbook, which the students had to analyze data. The teacher graded the lab and a correct answer depended on the accuracy of the answer. The other five assignments were handouts that were replicated from the supplementary materials. The assignments were completed and graded in class.

A weekly test was given to both classes. The content of the test depended on what was covered during the week. The format usually contained multiple choice and short answer questions. Three evolution tests were observed, which were taken before the treatment. Three ecology tests were observed, which were taken during the treatment.

The Post Survey (refer to Appendix C) was similar to the pre-survey. It contained both statements with likert scales and open-ended questions. The statements were different from the pre-survey, but the same themes were carried on in both surveys. These statements showed a favor to music or silence in the classroom. The only question similar in both surveys was one open-ended question, which the students had to describe their learning environment. It will be compared to the pre-survey to see how much it changed or stayed the same.

Procedures

The study took place in two ninth and tenth grade biology classes for approximately four weeks. The experimental group received the treatment. Background music was played as soon as the students entered in the classroom. Music was played throughout the entire class period. The
experimental group had music in the background regardless of the activity. Music was played during lecture, labs, independent work, cooperative work, and tests. The control group received no treatment.

Both groups learned the same content at the same pace. Activities, assignments and formal assessments, written by the program associated with the textbook, were the same for both groups. Assignments and tests were assigned or conducted on the same day. Directions were given orally and written on the overhead. The same strategies were used in both classes.

Both groups were given the multiple intelligences before the study. Only the experimental group was observed in regards disposition in the classroom, therefore they were given the pre and post surveys and interviews were conducted. The pre-surveys were given on before the study. Both groups were asked to write their thoughts on the environment and their feelings in class. At the end of the study, individual interviews were conducted with the experimental group. The post survey was conducted on the last day of the treatment.

Analysis

The dispositions of the students in the experimental group were observed. The pre-survey, post-survey, and interviews were used to analyze student disposition. Inductive analysis was used to develop any common themes or patterns throughout the data. The results of the multiple intelligence survey were taken into consideration to see if the top intelligence preference had correlation with how the students reacted with the treatment. The analyses of the data were done within the group. Three patterns were observed with the responses. Students either favored music, or favored silence, or indifferent.

The survey statements were grouped into the three patterns. The number of student responses for each likert scale was counted. Students that responded with a three or four
according to the scale were grouped together since they were students who highly agreed or agreed with the statement. The students that responded with a one or two were grouped together since they highly disagreed or disagreed with the statement. These ratios were compared to the post-surveys.

Similar patterns and grouping of responses were done in order to see a comparison. Interview results showed a similarity in the themes that came out of the answers. The interviews were coded and organized within the three groups.

Three assignments before the treatment were calculated for its average for each student. The experimental group averages before the treatment was compared to the assignment average scores during the treatment. Comparison between the experimental and control group was made between their average assignment scores during the treatment. The average scores were used to obtain a p-value.

The average test scores for each individual student was found by taking the raw scores from each test and then divided. Each case study student had an average test score. Two comparisons were made with the average test scores. The experimental group was compared to themselves. The average of the three test scores taken before the treatment were calculated and compared to the average of the three test scores taken during the treatment. The other comparison was done between the experimental and control group. Only the three tests taken during the treatment was compared between the two groups. The average scores were used to obtain a p-value.

Summary

The four-week study was conducted in two ninth and tenth grade biology classes. Several data tools were used to answer the research questions. Surveys and interviews from the
Music in the experimental group were observed the effects of music on student disposition. Pre and post surveys were compared to see if any changes occurred. Interviews were compared with the survey results to see if any patterns developed. Assignment and test scores from both control and experimental groups were observed to see the effects of music on student achievement. Scores before and during the treatment will be observed for the experimental group. Scores of both control and experimental groups during the treatment will be compared to each other.
CHAPTER IV

FINDINGS

The purpose of the study was to observe the effects of music on student disposition and in performance. A couple of tools were used to answer both questions. Student disposition was observed via surveys and interviews of the experimental group. Similar themes were found in both data tools. Observing assignment and test scores of both experimental and control groups measured achievement.

Disposition

The statements in the pre-survey were organized into the three patterns, like music and noise, like some noise, and do not like music/noise. The survey gave an idea on student thoughts towards the use of music/noise both at home and in the classroom. Out of the fifteen questions, four revealed the feelings of the students towards music and noise in the classroom (refer to Table 2). Three students felt that they can study too all kinds of music, while five students felt otherwise. Six of the students can study with multiple things in the background. Out of the eight students, four can only study with certain music around them. Although the previous three questions specifically asked about music, the last statement pertained to having some kind of noise in the classroom. Five students said that they do not work better if there is noise in the classroom.
Music in the Pre Survey: Liked Music (Experimental n=8)

<table>
<thead>
<tr>
<th></th>
<th>A lot like me</th>
<th>Like Me</th>
<th>A Little Like me</th>
<th>Very Little like me.</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can study too all kinds of music around me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2.25</td>
</tr>
<tr>
<td>I study with multiple things in the background (tv, music, siblings, etc)</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td></td>
<td>3.375</td>
</tr>
<tr>
<td>I can only study with certain music around me</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>I work better when there is noise in the classroom.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>1.75</td>
</tr>
</tbody>
</table>

Table 2: Pre-Survey Results of Treatment Group

The students answered an open-ended question, in which they described their ideal learning environment. Out of the eight students, four mentioned using music when describing their ideal learning environment, while three students liked having silence, and one did not respond to the question at all.

In the post-survey, the experimental group was asked different statements. The statements can be grouped into similar patterns as the pre-survey (refer to Table 3). Four questions dealt with students’ attitude towards having music in the classroom. Seven of the students like having music in the classroom. Seven also thought that music was a nice addition in the classroom and that music was so much better than silence. Six thought the music was pleasant to hear in the classroom.
**Post Survey: Liked Music (Experimental, n =8)**

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Somewhat disagree</th>
<th>Disagree</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>I liked having music in the classroom.</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>3.375</td>
</tr>
<tr>
<td>The music was a nice addition in the classroom.</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>3.125</td>
</tr>
<tr>
<td>The music was so much better than silence.</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>3.25</td>
</tr>
<tr>
<td>The music was pleasant to hear.</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>2.875</td>
</tr>
</tbody>
</table>

Table 3: Post Survey: Like Music

The same open-ended question from the pre-survey was asked in the post–survey. After the experimental group experienced music in the classroom, four students mentioned music in their response, two preferred the silence, and one student was indifferent and showed no preference.

Individual interviews were conducted to provide an opportunity for the students to highlight their disposition with music in the classroom. The responses showed a pattern of why the students liked to have background music and while others preferred to now have music at all. Out of the eight students in the experimental group, only five participated in the interview process. Two of the students preferred to have music in the classroom. Both students mentioned their ability to focus more and it improved the environment in the classroom (refer to Figure 1 and 2).
Music in the Classroom

J 6 Was it better than silence though?
E 7 Yeah.
J 8 Why?
E 9 Because I usually do my homework with music so I’m not like when it’s silent I don’t really concentrate that much compared to music.
J 11 So you liked having music better?
E 12 Yeah.

Figure 1: Interview Responses of Student E (Experimental Group)

J 12 Was it a good thing that I had music in the background?
Dy 13 Yeah
J 14 Why do you think it so?
Dy 15 Because most of the class is quiet and its good to have a type of music in the class
J 17 Why?
Dy 18 We concentrate better like that. At least I do.

Figure 2: Interview Responses of Student Dy (Experimental Group)

Two students did not like the music in the classroom. Silence was preferred because the music was thought to be distracting. The music got in the way with their focus. The other student liked silence because it is what they needed to be focus (refer to Figure 3).

J 1 What did you think about the music in the classroom?
Da 2 I thought it was gonna be cool, but I realized it distracted me.
J 3 How did it distract you?
Da 4 I was trying to do my work and I tried to go with the beat. And then I tried to hear the music instead of doing the work.

Figure 3: Interview Responses of Student DA (Experimental Group)

Achievement

The experimental and control group received the same assignments on the same day. The pace of the content delivered for the assignment was similar for groups as well. The same three assignment scores assigned during the treatment period were compared. Figure 4 shows a similarity in the distribution of the grades. Both groups had the same amount of students that
received a B average on the assignments. The experimental group had no student with an F average, while 13% of the students in the control group. A t-test compared these averages and a p-value 0.8279 revealed that the scores are not statistically significant.

Figure 4: Distribution of Average Assignment Grades

The assignment scores before and during the study of the experimental group were also compared. Three assignments were looked at before the treatment and set three assignments were observed during the treatment. The three assignments during the treatment were the same assignments as found in Figure 4. Figure 5 observes the averages of each student for all of the assignments before music was applied in the classroom. Figure 6 observed the assignments during the treatment period. These averages were compared and a p-value of 0.1635 was calculated. This comparison does not show a statistical significance in showing a difference in their score when music was and was not being used in the classroom.
Figure 5: Assignment Average Scores Before Music (Experimental Group)

Figure 6: Assignment Average Scores With Music (Experimental Group)
Similar comparisons and observations were done with the test scores of both groups. The groups received the same content, instruction, and assessment. The distributions of the grades show that more students received a D average in the experimental group, while no student received a C average in the control group. Both groups had the same number of students that received an A or an F average (refer to Figure 7). When the scores were compared, a p-value of 0.745 was calculated. Just like the assignments, the test scores were not statistically significant.

Three tests before the music treatment were compared to three tests given during the music treatment allowed for longitudinal observations of the test scores of the experimental group. The three tests during the treatment period were the same scores analyzed in Figure 7. The average of each student’s test scores before the treatment (refer to Figure 8) were compared the averages during the treatment (refer to Figure 9). A t-tests of the data sets calculated a p-value of 0.4408. The value was not statistically significant.

Figure 7: Distribution of Test Score Averages of Both Groups
Figure 8: Test Average of Experimental Group Before Music

Figure 9: Test Average of Experimental Group During Music
Summary

By the end of the study, more students changed their perspective to the use of music in the classroom. Music was appreciated because students felt more focus and were in a better mood. Both assignment and test scores did not show statistical significance in showing the effectiveness of music in the classroom. The data collected was limited. The study had a lot of limitations. Major improvements can be made in order to further the study for music in the classroom.
CHAPTER V
DISCUSSION

Overview of the Study

The purpose of the study was to observe the effects of background music on student disposition and achievement in the classroom. Two classes were observed and received the same content, instruction, and assessment. The difference between the two groups was that one group received a treatment (experimental group), background music in the classroom, while the other group (control group) received no treatment. Surveys and interviews were used to observe student disposition in the experimental group. The responses taken, before and after the treatment, were compared to see if there were any changes in disposition. Individual interviews were conducted to compare their responses to the surveys.

The assignment and test scores of both groups were compared in order to see the effects of music on student achievement. Two different kinds of comparisons were done. The treatment group was compared to itself, seeing if there was a longitudinal difference in their test scores before and during the treatment. The second type of comparison took the three tests that were taken during the treatment, and the scores of the control group were compared to the experimental group.

Summary of Findings

Student disposition changed for some students when music was used in the classroom. The surveys showed an increase in number of students favoring music in the classroom versus minimal noise or silence. When asked open-ended questions, students mentioned an impact the music had in their mood and focus. More students showed a preference to music over silence in
the classroom by the end of the study. The reasons given for the preference were students felt more focused and it improved their mood in the classroom.

Both test and assignment scores did not show a statistical significance in showing a correlation between the use of music and achievement in class. Scores were not affected by the use of music. Observing the experimental group for a longer period of time, and comparing their averages before the music and during the music did not show a statistical significance between their scores. The second type of comparison, in which the scores of the experimental group during the treatment period were also compared to the control group, was not statistically significant. Regardless of the presence of music, the scores of the students were not significantly affected.

Conclusions and Recommendation

When students were asked about their preference about the presence of music in the classroom to no music in the classroom, they favored having music. Students shared their perspective by stating that the music was a good addition because the silence created an uncomfortable atmosphere in the classroom, and students made it more difficult to focus. Students, who at first thought that music would not be helpful, changed their minds by the end. Although only a handful of students were represented in this study, majority of the students observed the difference in the environment when music was used.

The improvement in the preference of music in the classroom shows that there is something to be said about changing the classroom environment. Music improved the social and emotional well being of the students, therefore students felt more comfortable and at ease.

The assignment scores and test scores do not show any significant contributions to using music in the classroom when it comes to improving achievement. When students were given an
opportunity to discuss their opinions on using music, many mentioned using music during independent work. At the same note, a couple of students mentioned that the music was distracting during tests.

These results show that some students need an external positive stimulus. Instead of playing one type of music for everyone to hear, students can have the choice of using their own music players during independent work (whether it be an assignment in class or test). If students feel that they will benefit from an environment with stimulus (such as music) teachers should allow them this option. To ease classroom management issues that may arise, a set of boundaries or rules can be set at the beginning of the school year to ensure effectiveness. Using their own personal music players will allow them to choose their own music styles, to help them create their mood of focus and enriching learning environment. To those students who do not choose to use their music players, they can create their own silent environment that they need to focus.

Limitations and Future Studies

In order to observe the effects of music, the study should be longer in length. Observations were limited with only having several weeks to gather data. Students would become accustomed to the music, and this might have affected their disposition towards the use of music in the classroom. The change in the setting may be distracting for some students, therefore time to adjust needs to be considered. The content learned within the length of study was limiting as well. Only looking at one unit limits the scope of the study. Having music or no music may not matter because of the difficulty of the concepts in the specific unit.

If the study was longer in length, more patterns may have developed. A future study can observe whether the length of study can reveal whether students retained the knowledge for a longer period of time, rather than just for short-term memorization. Being able to observe
multiple units, rather than one, can eliminate the differences in rigor and skill needed for each unit. A future study can be longitudinal and see the effects of music for an entire school year, rather than several weeks.

Choosing one control group and an entirely different experimental group had its limitations. The time of day the students participated in the study can affect the way music affected the data. One group was during the morning, while the other group was after lunch. Students behave differently throughout the day, and it was clear the two groups had their own differences. These factors can affect the way the average scores can be compared.

A different approach to the study would be comparing the same group of students to themselves with both the music and no music treatment in their classroom. Observing the students in both settings, for a longer period of time, can provide insight on how the students react to both environments. Comparing the students to themselves is not impacted by the difference in time and proficiency levels. The data can be more consistent for each individual, rather than a comparison to another group. This approach can compare students as a group and also as individuals.

The small case study students of nine per group (a total of eighteen students) limited the findings of the study. With the case study being so small in size, it impacted whether students would show an improvement. For example, at several points, a couple of the case study students would be sporadically absent causing their test scores to be low that week. Their low scores would impact the average taken at the end. A small case study also impacted the possible patterns that could have been found during interviews and surveys. It limited the scope of the classroom point of view because it limited the interpretation to only a handful of students. The small case study group also limited the amount of data collected. For example, the students were
asked to keep a running journal for the length of the study. At the end, less than half of the students actually completed the journaling activity, and furthermore, the quality of the journaling affected the patterns observed.

A larger sample size can impact the data and observations made in future studies. Different patterns may result in larger sample sizes because more interviews could be conducted and more survey results would be tabulated. Future studies with larger sample sizes should also consider looking at more assignments and test scores. There are a variety of ways to assess student, and possibly looking at a array of assessments may cause a difference in the data.

The classroom set up created a difference in how the students received the music. The music was played out of the television speakers that were found in the front of the classroom. The range of the volume of the music was limited. Students who sat near the television heard the music the clearest. Students who sat further away from the television had a difficult time hearing the music. The type of music limited the study as well. Majority of the case study students commented on how they would change the type of music used. The instructor chose the music and no suggestions were taken from the students. The type of music in the classroom distracted students. They were focused more on their dislike of the music, rather than the task at hand.

If a classroom had a sufficient speaker system that was arranged properly all around the classroom, each student would receive the music at the same volume regardless of where they are located in the classroom. It creates a different environment, and the purpose of the background music would be served rather than just having a handful of students hearing it at the front of the classroom.

Future studies can also change the way students receive music. Students could use their own personal music players. Giving the students a choice to use, or not to use music can impact
individuals differently. Some students viewed the music as a distraction rather than a focus tool. Students who do not favor using music can still have an environment that is suited for them. Music won’t be forced upon the entire class; only those who choose to use music. Each student who chooses to use music can choose their own types of music and can create their own mood that can help them be successful in the classroom.

The entire school body was impacted by multiple outside factors. These events negatively impacted the students. These were factors, regardless of planning and thought, were not expected and it may have impacted the results. Students were deeply affected by several consecutive events, in a short period of time. Regardless of what was done inside the classroom, the students were distracted. The events affected their social and emotional well being outside of the classroom that it impacted with how they acted inside the classroom.

An inconsistency in the school schedule affected the way in which findings were attained. There were many schedule changes and instructional interruptions within the weeks of study, which students were not in a consistent environment. A couple of case study students would be absent from school because of personal or illness issues. This constantly changed the number of participants on a daily basis.

Summary

The study has a lot of potential. Recommendations such as larger sample size and length of study can improve the study. More data can be gathered and other patterns not seen in this study can be observed. Music in the classroom should be studied further because there is plenty that is unknown about its effects. Teachers and students should be taught how to music in order to create a better social and emotional learning environment.
References

American Association for the Achievement of Science (1990). *Science for All Americans.*


## Appendix A

### Pre-Survey: Survey I

On a scale from 1-4, answer the following questions. Answer every question, and only choose the best answer.

1 = Very little like me  
2 = A little like me  
3 = Like me  
4 = A lot like me

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I like to study in a quiet area.</td>
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<tr>
<td>2. I prefer to study in an area with noise.</td>
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<tr>
<td>3. I cannot study when there is distracting noise around me.</td>
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<td>4. I study with multiple things in the background (tv, music, brothers and sisters, etc).</td>
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<td>5. I have to be alone so I can study efficiently.</td>
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<td>6. Only certain kinds of music can help me study.</td>
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<td>7. Noise distracts my attention.</td>
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<td>8. It does not matter what is going on around me when I study.</td>
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<td>9. I can only study with certain music around me.</td>
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<td>10. I cannot study if the noise is too loud.</td>
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<td>11. I can study in a room with a lot of noise.</td>
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<td>12. I work better when there is noise in the classroom.</td>
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<td>13. I hate it when the classroom is too noisy.</td>
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<td>14. I can study too all kinds of music around me.</td>
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<td>15. Noise keeps me focused.</td>
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</table>

Describe your IDEAL learning environment.  
What kind of noise can help you stay focus?  
What kind of noise distracts you?  
If you study with music on, what kind of music do you listen to?
Appendix B

Pre-Survey: Survey 1A

Students were asked to respond each open-ended question.

Where do you study at home? Describe the environment.

List things that help you focus at home.

List things that distract you at home.

List things that help you focus in the classroom.

List things that distract you in the classroom.

What are some things that can help you stay focus that you would add in the classroom?
Appendix C

Post-Survey

On a scale from 1-4, answer the following questions. Answer every question, and only choose the best answer.

1 = Disagree  
2 = Somewhat disagree  
3 = Somewhat agree  
4 = Agree

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<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td>1. I liked having music in the classroom.</td>
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<td>2. The music was a nice addition in the classroom.</td>
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<td>3. There were times when I didn’t even realize that there was music in the background.</td>
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<td>4. The music was so much better than silence.</td>
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<td>5. The music was pleasant to hear.</td>
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<td>6. I would have preferred silence in the room to music.</td>
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<td>7. The music was distracting.</td>
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<td>8. The music was too loud.</td>
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<tr>
<td>9. I did not like having music in the classroom.</td>
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</table>

I liked it when music was playing during: (mark all that apply)

Lecture  Labs  Independent work  Group Work  tests/quiz

If you can change anything about the environment, what would it be (mark all that apply):

Volume of music  when the music is played  type of music  Other

After experiencing having background music in the classroom and a quiet classroom. What is your ideal learning environment. EXPLAIN WHY.