

IMPACT OF MUSIC ON STUDENT ACHIEVEMENT

by

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CERTIFICATION OF PROJECT WORK

We, the undersigned, certify that this project entitled IMPACT OF MUSIC ON STUDENT ACHIEVEMENT by Emily A. Szentgyorgyi, candidate for the Degree of Masters of Science in Education, Curriculum and Instruction, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.



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Abstract

This study compares the impacts of playing classical and pop music as background music on student achievement in reading. The study took place over a period of four weeks in one elementary classroom, and was conducted in an A-B-A-B Single Subject Design. The target population was 17 students in a general education, 5th grade classroom in a public elementary school within a rural school district. The findings suggested that playing pop music improved student scores more than playing classical music did.

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Introduction

The purpose of this literature review is to examine research on the impact of music in the classroom on student test or homework scores. Research on type of music and delivery method in the classroom will be discussed. The participants in the research will include children in elementary school, middle school, high school, undergraduates in college, and adults in the work force.

Literature Review

Background Music's Influence on Academics

Engagement with music can create positive and lasting effects on brain function (Kuzmich, 2010). Listening to music stimulates cognition (Southgate, 2009), improves memory (Kang, & Williamson, 2014), increases attention, provides inspiration and motivation, and facilitates a multi-sensory learning experience (Brewer, 1995; Brunken, Plass & Leutner, 2004).

Hallam and Price (1998) explored the effect of background music on student achievement. The sample included 10 children diagnosed with Emotional Disorders, ages 9 and 10, and they acted as their own control group in the study. The class was instructed to complete mathematics work independently during each session. Four of the sessions included background music, and four did not. Students were assessed by how many problems they could do correctly during the given time frame. The results showed that sessions including background music had a significantly increased number of correct answers (Hallam & Price, 1998).

Leguto and Trissler (2012) also chose to focus on students with disabilities for their case study. The participants in this study were 9 students, ages 11-12, in 6th grade. The students were part of a Learning Support class where each student had specific learning disabilities in reading, writing, or both. The intervention involved playing classical background music (Mozart) for

seven weeks as students completed their writing assignments. The music was selected by the classroom teacher because it is classical and up tempo in nature (Leguto & Trissler, 2012). The results demonstrated a significant improvement in the writing efficiency of all students participating in the experiment (Leguto & Trissler, 2012). This study supports the idea that background music helps students improve academically, but even more so because the participants have learning disabilities. The significance of these results is that background music can positively influence a variety of learners.

Bloor (2009) also focused his study on the impact of background music at the elementary level. The study included 47 children, ages 10 and 11, from three different schools of mixed ability levels and socioeconomic statuses. The students were put into four different classrooms and two rooms were given tests in reading and two were given tests in mathematics. For each subject one was implemented with background music and one was implemented without. The results showed that the student scores improved in both subjects during the sessions including background music. However, the results were not deemed statistically significant for the study.

Hailat, Khasawneh, Shargawi, Jawarneh, and Al-Shudaifat (n.d.) decided to consider to effects of background music in the classroom on middle school students. This study focused on 7th grade students who were divided into two groups, one group received the experimental treatment (background music) and the other group was the control group that did not receive treatment. Students in the experimental group listened to background music during instruction. The students were given a multiple-choice social studies pre-test and post-test to measure the students' knowledge. The results showed significant differences in data in favor of the experimental group.

Castro (n.d.) evaluated the effect of background music on high school students. The sample for this study included 9th and 10th grade students in a biology class. The students were split into two groups, experimental and control. The study lasted for four weeks. The experimental group had music playing as soon as they entered the classroom, and during all class activities, including tests. In the experimental group no one scored an F, and in the control group 13% of the students scored an F. The results are in favor of the experimental group; however they were not statistically significant.

Even though two of these studies (Bloor, 2009; Castro, n.d.) were not considered statistically significant, the data collected for all age groups consistently show results in favor of background music because the students improved academically. Music (especially the calming and soothing kind) has an intellectual impact on the brain that is long lasting. Music helps the brain to focus, retain information, memorize, and help exert brain cognition. These studies have also shown that music can have these positive influences on a variety of learners, even those with learning disabilities (Hallam & Price, 1998; Leguto & Trissler, 2012). It is necessary for teachers to help students with these processes in any way possible, and according to these studies, that may include using background music.

Background Music's Influence on Behavior

Music can have an impact on the moods, emotions, and behavior of groups of people, as well as individuals (Hallam & Price, 1998). Background music can be used to create a positive atmosphere. Background music can influence student behavior, as well as physiological, emotional and cognitive processes (Ziv & Dolev, 2013). Every day, people intuitively use music to create a desired atmosphere and regulate their moods (Ziv & Dolev, 2013). Music lightens the

students' moods, and relieves anxiety, helping to create a more pleasant and relaxing environment (Castro, n.d.; Ziv & Dolev, 2013).

Hallam and Price (1998) investigated the impact of background music on student behavior, in addition to academic achievement. Hallam and Price (1998) examined 10 children, ages 9 and 10, all of them diagnosed with Emotional Disorders. The students acted as their own control group. The class was given independent mathematics work to complete during each session. There were four trials without background music and four trials with background music. Student behavior was measured by how many rules they broke during the session. A paired t-test indicated a significant difference between the initial session, and the final session. There were fewer rules being broken while music was playing in the background, but not statistically significant (Hallam, 1998). Music reduces problem behaviors, and improves desired behaviors (Desrochers, Oshlag, & Kennelly, 2014).

Some research has examined the influence of background music on concentration (Thompson, Schellenberg, & Letnic, 2011; Huang & Shih, 2011). Thompson et al. (2011) focused on the impact of the volume and pace of the background music. The sample included 25 participants that were given four minutes to independently read a passage, followed by three minutes to answer six multiple choice questions to assess their reading comprehension (Thompson et al., 2011). Findings revealed that listening to background instrumental music is most likely to disrupt reading comprehension when the music is fast and loud (Wakshlag, Reitz & Zillmann, 1982), and reading comprehension was unaffected by slow or soft classical music (Thompson et al., 2011). This is essential to take into consideration upon further research in the classroom.

One case study explored the effects of background music on bullying in the classroom. Ziv and Dolev (2013) conducted a study involving 56 students, ages 11 to 12 years, where background music was playing during their 20 minute recess period to see if it would reduce bullying behaviors. The bullying behaviors in this case study were defined in two forms: direct bullying behaviors (i.e. hitting, kicking, threats, teasing, taunting), or indirect bullying behaviors (i.e. rumors, exclusion, or manipulation) (Ziv & Dolev, 2013). The songs played in the background were chosen from a yoga relaxation disc (Ziv & Dolev, 2013). The results of the study revealed that the occurrences of direct and indirect bullying were significantly reduced during the days that the calming yoga music was being played in the background. The results of the survey showed that when the background music was being played students had less anxiety during recess and enjoyed it more overall (Ziv & Dolev, 2013). However, once the music was removed the students once again reported increased bullying and a decrease in enjoyment of recess (Ziv & Dolev, 2013). Therefore this study is another example of the positive impact that background music can encourage in a classroom.

Instead of the classroom, Huang & Shih (2011) chose to look at the effects of background music in the work place. The study involved a sample of 89 workers with age ranges from 19-28 years old (Huang & Shih, 2011). The participants were divided up into four groups, each with different background noise environments: group one had no background music, group two had popular songs, group three had classical light music, and lastly group four had traditional Chinese music. Chu's Attention Test was administered to all four groups while the music was playing (Huang & Shih, 2011). Analysis of Variance (ANOVA) was utilized to determine whether or not different types of music influenced attention test performance (Huang & Shih, 2011). The results of this study indicated that background music influenced listening attention,

but it was not statistically significant (Huang & Shih, 2011). The study revealed that if the music was strongly liked or disliked by the listener it caused a greater distraction than listening to no music (Huang & Shih, 2011).

Influence of Melody with Instruction

Although not technically background music, incorporating melody into instruction can be beneficial to student learning (Wallace, 1994). In this study Wallace tested to see if adding melody would aid in recalling text. She focused on 64 undergraduate students in an introduction to psychology class. Students were told that they were going to hear verses either sung or spoken and should try to recall as much as they can verbatim and write it down. The results revealed more accuracy for recalling the sung verses than the spoken ones.

Music can improve memory, increase attention, focus concentration, and release tension (Brewer, 1995). Based on the extant research, the results have shown that multiple ways of including music into the classroom can be beneficial to the students. Whether the music is mixed into the background noise or is within an active part of learning a new definition or phrase, music has been proven to help increase retention of information, and fuel brain cognition.

Regardless of the form, music in the classroom, either in background or through melody, has proven to be beneficial to learners of all ages, and should definitely be implemented by all instructors. Since examining this research, I am certain that I will always try to incorporate music into my classroom in one way or another.

Types of Music

Throughout my findings in regards to this topic, I have commonly seen references to “The Mozart Effect” (Rauscher, 2003; Brewer, 1995; Merrell, 2004; Ivanov, 2003; Southgate & Roscigno, 2009). The Mozart Effect refers to a study in which 36 college students who listened

to a Mozart sonata for 10 minutes scored higher on a given task than after listening to relaxation instructions or silence. Based on this result, many researchers have continued to examine the influence of Mozart in the classroom, as well as other types of music.

Ivanov and Geake (2003) questioned whether playing Bach versus playing Mozart in the background would have a greater impact on student achievement. The study consisted of 34 males and 42 females in 5th and 6th grade. There were three groups of students, each in separate classrooms, one listening to Mozart in the background, another listening to Bach, and the last group listened to no additional music or background noise. The results depicted that the Mozart and Bach classrooms both scored significantly higher on their assessments than the classroom without any music. However, in regards to Mozart versus Bach, the results were not statistically significant and both composers appear to be equally effective.

Researchers have suggested using mood calming, or soothing music in the classroom background (Hallam & Price, 1998; Črnčec, Wilson & Prior, 2006). Playing the right type of music at appropriate times will increase student productivity and relaxation, as well as help decrease stress levels (White, 2007). Different types of music can affect mood and arousal differently, and soothing music could be used as a tool in the classroom when normally developing children are over – aroused (Črnčec, 2006). Hallam and Price (1998) played different songs for the students in their study and had them complete a survey to determine which songs were most calming and soothing from the perspective of the children. The music was selected only if the majority of the students found it calming.

Some research has examined the effect that different genres of music might have on concentration and achievement outcomes (Tze & Chou, 2010; Domingo, n.d). Tze & Chou (2010) conducted a study that involved two experimental groups, one listened to light classical

music and the other listened to hip hop, and one control group that listened to no music. The results of the study concluded that hip hop had a significantly adverse effect on reading comprehension when compared to light classical music or no music (Tze, 2010).

Similarly, Domingo (n.d.) did a study that compared the effect of classical music and electronic music. This study was conducted with 24 undergraduate students and the effects of classical and electronic music at high and low volumes were examined. The results showed that classical music was calming and peaceful for the students and electronic music was fast paced and arousing (Domingo, n.d.). The results indicated that neither type of music or volume level made a significant effect on the ability of the students to recall new information in this study (Domingo, n.d.).

Few studies have paid particular attention to the type of music chosen for the research experiments. Langan & Sachs (2013) had a pre-established mix of pop and rock music played in the background. Love (2006) consulted a music expert to carefully select orchestral and acoustic piano music with consideration to consistency in tempo and rhythm. Jancke & Sandmann (2010) originally composed musical excerpts specifically for the purposes of the study to ensure that students had no familiarity with the background music. The findings for these experiments were not statistically significant, however type of music played in the background was considered an important aspect and is relevant to my research.

Based on the findings found in the previously discussed research, it appears that the type of music playing during the class activity or independent work has a large influence over whether or not background music is successful. If a class is going to use music when they are working during a quiet and independent period, then the teacher should be careful to select music that is calm and peaceful and will help the students' focus better on the material. If the class will

be working on an activity where they will need a lot of energy, then the song playing in the background should be upbeat.

I have concluded that I want to further investigate the influence of using different types of music in the classroom. This is significant to explore because the findings could help students to focus and improve their learning. The studies that I have read indicate that soft or classical music is often the most beneficial for student concentration and test scores. The research question driving this study is: How do other genres (besides classical) impact student learning outcomes?

Methodology

Setting

This study took place in an elementary school in a rural school district within Western New York. According to the New York State Report Card for the 2013-2014 school year, there were 250 students enrolled in this school district. The average class size during that time was 17 students. This study observes and documents the effects of using different types of background music in the classroom on student test scores in reading.

Participants

According to the New York State Report Card for the 2013-2014 school year, the ethnicities of the students within the district include: 86% Caucasian, 10% Hispanic or Latino, 4% Multiracial, and 1% American Indian or Alaska Native. Fifty-three percent (53%) of the students in the district are eligible for free lunch, and 16% of the students are eligible for reduced lunch. The participants in this study were selected by non-random convenience sampling. The target population was 17 students in a general education 5th grade classroom in the elementary school.

Design

This study uses the correlational research and survey research approaches. The primary methodology of the study is quantitative, and in addition one qualitative tool was used. The study took place over a period of four weeks in one classroom and was conducted in an A-B-A-B Single Subject Design. The research looked at the effect of different types of background music in the classroom on the subject quiz scores in reading. The first week, music was not played in the background during independent work in reading, and the baseline quiz scores in reading were recorded. The second week, the first intervention took place and classical music was played in the background during independent work in reading. The reading quiz scores for week two were recorded and analyzed to see if there is a correlation between the classical music and reading quiz scores. At the end of week two, students were given a three question survey about whether or not they felt that the background music helped them focus. The third week, music was not played in the background during independent work in reading, and the baseline quiz scores in reading were recorded once more. The fourth week, the second intervention took place and pop music with lyrics was played in the background during independent work in reading. The reading quiz scores for week four were recorded and analyzed to see if there is a correlation between the pop music and reading quiz scores. At the end of week four, students were given a three question survey with researcher created questions about whether or not they felt that the background music helped them to focus.

Independent variable.

The independent variable in this study is the types of background music playing during independent work and quiz taking. The two types of music are classical and pop music with lyrics.

Dependent variable.

The dependent variable in this study is the student quiz scores in reading.

Data Collection and Analysis

The student quiz scores in reading were analyzed to determine if there is a correlation between listening to one type of background music and an increase in student test scores in reading. In addition, the student survey was also analyzed to determine if they felt that one type of music helped them over the other. In order to respect confidentiality, the students' names were not used. Instead, a class number was assigned to each student for easy reference. All records will be kept in a locked file cabinet and stored for two years. After this, all records will be destroyed.

Results**Findings**

This data was collected from 17 students in a 5th grade classroom over a period of four weeks. One baseline week took place, where no music was played in the background during independent work in reading, and then a quiz was given to the students. Followed by a week of intervention, where music was played in the background and then a final quiz score was collected for comparison. This two-week process occurred twice, once for classical music, and then again for pop music. In order to determine if the music had a beneficial influence on academic achievement, the data was first examined to determine how many students' scores improved, then to see how much the post-test scores improved from the pre-test scores.

Classical Music Test Results.

Student	Baseline Quiz 1 Score	Classical Music Quiz Score
1	75%	100%

2	88%	88%
4	75%	75%
5	88%	88%
7	88%	75%
8	50%	75%
9	50%	88%
10	63%	75%
13	75%	88%

For the classical music post-test results, 56% of the students improved from their pre-test scores. Out of those students that improved, their scores had an average improvement of 22.6%.

Pop Music Test Results.

Student	Baseline Quiz 2 Score	Pop Music Quiz Score
2	100%	100%
3	75%	63%
4	25%	88%
6	75%	88%
7	63%	50%
8	75%	63%
10	25%	88%
11	50%	100%
12	75%	100%
13	38%	88%
14	63%	75%

For the pop music post-test results, 64% of the students improved from their pre-test scores. Out of those students that improved, their scores had an average improvement of 39.4%.

Student Survey Responses.

The students were given a survey at the end of each two week period. The survey contained three researcher- invented questions related to their feelings about the background music, whether they felt that background music helped them focus, or whether they would have preferred no background music at all (See Appendix).

Survey	Classical Music	Classical Music	Pop Music	Pop Music
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Questions	Student Responses "Yes"	Student Responses "No"	Student Responses "Yes"	Student Responses "No"
1) Did the background music make it more difficult to focus on your work?	3/9 – (33%)	6/9 – (67%)	3/11 – (27%)	8/11 – (72%)
2) Did the background music help you to focus on your work?	6/9 – (67%)	3/9 – (33%)	7/11- (64%)	4/11 – (34%)
3) Would you have preferred there to be no background music while you were working?	4/9 – (44%)	5/9 – (56%)	2/11 – (18%)	9/11 – (82%)

In response to the first survey question, for both surveys the majority of the students said that the background music did not make it difficult to focus on their work. For the classical music survey, 67% of the students said that the background music did not make it difficult for them to focus on their work. For the pop music survey, 72% of the students said that the background music did not make it difficult for them to focus on their work. Slightly more students said that pop music did not make it difficult for them to focus.

In response to the second survey question, for both surveys the majority of the students said that the background music helped them to focus on their work. For the classical music survey, 67% of the students said that the background music helped them to focus on their work. For the pop music survey, 64% of the students said that the background music helped them to focus on their work. Slightly more students said that classical music helped them to focus.

In response to the third survey question, for both surveys the majority of the students said that they preferred to have background music. For the classical music survey, 56% of the

students said that they preferred to have the background music. For the pop music survey, 82% of the students said that they preferred to have the background music. More students said that they preferred to have the pop background music.

Reliability of the Data

In regards to reliability in this study, I attempted to be consistent with my intervention, but there are some factors that were unplanned for that could make the reliability of this data uncertain.

I did my best to be consistent with the weekly quizzes that were used to assess the impact of the background music. Each quiz had eight multiple-choice, researcher-created questions regarding reading comprehension or vocabulary related to material from that week.

The unforeseen complications that occurred with this included difficulty collaborating with the teacher of the classroom on which material to include in my quizzes, as well as difficulty making sure that the material that the students are being quizzed on reflects the tasks that they are working on during independent work. For example for the classical baseline quiz, the teacher told me to quiz them on a story they would be reading all week in class, however when I administered the quiz, I was informed that the students never finished the story. It was also difficult to assess what students were learning during independent work because some days each student would be reading a different story, which made consistency of quizzes nearly impossible.

The music that I used in the background for the intervention was carefully selected. I made playlists on Spotify Premium™ in an attempt to control the music being played. There were no commercials being played in order to prevent distraction or disruption to the study. The classical music that I chose included Mozart, Beethoven, etc., because they have been proven to stimulate the brain in previous research (Ivanov, 2003; Southgate & Roscigno, 2009). The pop

music I selected included more classical pop music with lyrics from the 1970s or 1980s in an effort to play music unfamiliar to the students to not be distracting. I also tried to select songs that were more mellow than current pop songs, so that students would not feel the urge to get up and dance while doing independent work. Also, if the music was too fast or loud it could distract from the students' reading comprehension (Thompson et al., 2011).

An unforeseen complication that I had with playing music was that the students did take some time to adjust to having music playing in the background; it seemed to be distracting to some of them at first, which could have impacted the data. Also, I struggled with finding an appropriate volume for the music because I wanted all of the students to be able to hear the music in order for the intervention to be effective, however students in closer proximity to the computer seemed to be more distracted if the music was turned up.

Despite my efforts to be consistent in my intervention, these unforeseen factors may have affected the reliability of my data.

Interpretation of the Data

Based on the data that was collected, without considering outside factors, results show that playing pop music in the background had the greatest impact on student achievement on their quizzes. According to the data, 8% more of the students improved when pop music was played in the background. In addition, the scores of the students who improved when pop music played in the background had 16.8% more improvement than when the students had classical music playing in the background.

Discussion

Overview

This study explored the impact of two different types of background music in the classroom on reading quiz scores. The two types of music compared in the intervention were

classical and pop music. The findings in the study revealed that student quiz scores in reading had a greater improvement after the pop music had been played in the background during independent work.

Significance

There is a great significance to this study. If there are more things that can be done in the classroom that are proven to help benefit student learning, teachers should be actively trying to incorporate those things into their teaching and classroom environment. The findings for this study showed that other types of music besides classical could also be beneficial to student learning in the classroom. Perhaps pop music is a helpful motivator because students can listen to the lyrics and relate to the music. This study opens up the possibility to experimenting with more genres of music.

Limitations

There were a few limitations that I had while trying to conduct this experiment. One of the main limitations was that I had to collaborate with a teacher to do this experiment. If I had my own classroom and could alter the teaching plans to meet my needs for the study, it would have been easier. Being the teacher of the classroom would also ensure no misunderstandings about what materials the students are being quizzed on. The data would be even more reliable if the study had been done in a more diverse classroom. In addition, more portability with the music source might have made it more convenient to allow for volume adjustments.

Conclusion

This study shows that in addition to classical background music, background pop music could also be beneficial to student learning in the classroom. The findings from this study also open up more possibilities for studying the impacts of various other genres could have in the

classroom on student learning. With further research, teachers may begin to incorporate more music in the classroom to help benefit students.

Recommendations for Future Research

If this research were to be replicated more control over the classroom structure, quiz content, and organization of the lessons would likely be beneficial. This research only focused on the effects of music playing during independent work, which may not have provided enough opportunities for music to make a true impact on the student learning.

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Appendix
STUDENT SURVEY

Please circle YES or NO after reading each question.

1. Did the background music make it more difficult to focus on your work?
YES or NO
2. Did the background music help you to focus on your work?
YES or NO
3. Would you have preferred there to be no background music while you were working?
YES or NO