

The effect of baroque
music on the
performance of
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Effect of Baroque Music on Performance in Math Problem Solving Task among Grade Six Pupils of Zamboanga City State Polytechnic College A Research Proposal Submitted to the Faculty College of Liberal Arts Western Mindanao State University In partial fulfillment of the requirements in Psychological Research I Submitted by: Lilibeth Grifon Christie Annie M. Jalaron Audraiza Macaraya Arlynn Mae Tangon Chapter I Introduction Students' lives today are filled with large variety of experiences by which they develop either positive or negative attitudes toward certain experiences. Eventually, these attitudes develop into a guide to their behavior.

It has been noticed that most school learners are now musically inclined and the need to have a better teaching strategy to facilitate students' learning abilities is the prime reason why researchers want to pursue this study. This study focuses on the application of background music in the classroom setting to find out if providing music in the environment can have a significant difference in learners' performance. The influence of music on rates of learning has been the subject of study for many years. Research has confirmed that loud, background noise hinders learning concentration, and information acquisition. Background music is used to provide a welcoming atmosphere and help prepare and motivate students for learning tasks. It can energize lagging attention levels or soothe and calm when necessary.

Music in the classroom may have different effects, depending on the strengths and weaknesses of the pupils in the classroom. It may also depend on the existing level of noise at the school and surrounding area. Various researchers reported that kids seem to be vulnerable to excessive noise. For <https://assignbuster.com/the-effect-of-baroque-music-on-the-performance-of-elementary-students-on-problem-solving-task/>

children who are sensitive, environmental noise can be a source of stress. That's why for the past years, researchers experimented many ways of producing the healthiest sound possible. Several researchers have proven that classical and baroque music with some nature sounds are the most appropriate background music.

Some amount of background music may be helpful in the learning process. Original studies in the used of music in learning show that Baroque music was optimal for learning. Another study showed that Baroque music accelerates learning, and enhance both short-term and long-term memory. Baroque music, with its unique rhythmic structure and stability, is particularly conducive to memory, productivity and healthy, stress-free environments (Lawrence, 2001).

Baroque music describes an era and a set of styles of European classical music which were in widespread use between approximately 1600 and 1750. The original meaning of baroque is irregular pearl. Baroque music forms a major portion of the classical music canon, being widely studied, performed, and listened to. Baroque composers include J. S. Bach, Antonio Vivaldi, Handel, Chopin, Pachelbel and Alboni.

Background of the Study Mathematics is a subject where most learners have low achievement. Different reasons are presented on why learners have difficulty in dealing with math subjects. It even came to the point wherein learners cut classes during math subjects. Some respondents stated why they have low interest in math is because they get bored with numbers and teacher's chalk-board strategy is even reinforcing their boredom. Problem

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solving is a process of thinking that is directed toward the solution of a specific problem. The process involves the use of problem solving skills.

Yet the most difficult to teach in Mathematics is problem solving. Even high school students could hardly solve two-step problems. This is due to poor analysis and understanding of word problems. Proficiency in remediating the problem experienced by the students in this area is an essential skill of a competent educator (Miranda, 2004) One reason of boredom is the lack of interest but more so with the lack of environmental stimulation. Enriched environment is one of the most important factors that educators should look into for the reason that learners are widely curious with different stimuli that will encourage them to do their best in every endeavor.

Several researches show that instrumental music can enrich environment and can cause stimulation to learners which is present in the change of their physiological processes. Review of Related Literature This section will discuss the study of the effect of background music in learning. It also includes literature and studies on the effect of music in learning performance. This section will provide scientific evidence that support the claim that music is related to the improvement of mathematical performance. (Tria, Limpingco, Jao, ---) concrete operational stage is a period of concrete operational logical thought in number, class and orders (7-11 years old).

The child becomes increasingly capable of demonstrating logical thinking in relation to physical objects. A newly acquired capacity of reversibility allow him or her to mentally reverse action that was previously only than physically. The child is now able to mentally hold two or more variables at a

time when studying objects and to reconcile apparently contradictory data. He or she becomes more sociocentric, increasingly aware of the views of others. These new mental capacities are demonstrated by a rapid growth in the ability to conserve certain properties and to do relational thinking such as classifying and ordering objects.

Mathematical operations are also developed. The child becomes increasingly able to think of physically absent things based on the vivid images of past experiences. The child's thinking, however, is restricted to concrete things rather than ideas. (Hurlock, 1982) stated in her book that educators call late childhood the elementary school age. It is the time when the child is expected to acquire the rudiments of knowledge that are considered essential for successful adjustment to adult life. It is also the time when the child is expected to learn certain essential skills, both curricular and extracurricular.

Educators also regard late childhood as a critical period in the achievement drive -a time when children form the habit of being achievers, underachievers or overachievers. Once formed, habits of working below, above, or up to one's capacity tend to persist into adulthood. It has been reported that the level of achievement behavior in childhood is highly correlated with achievement behavior in adulthood. As their world expands with their entrance into school, so do children's interests. And with this broadening of interest comes an understanding of people and things which formerly had little or no meaning.

Children now enter Piaget has called the “ Stage of concrete operations” in thinking, a time when the vague and nebulous concepts of early childhood become specific and concrete. With rapid growth comes a sapping energy. This leads to a disciplination to work and to attitudes of boredom toward any activities that require effort on the individual’s part. While underachievement after begins around the fourth or fifth grade in school, when early enchantment with school gives way to disenchantment, it generally reaches its peak during puberty.

Barr and Seashore (as cited in Kong, 2005) says that it is easy to see how active listening can be applied to the steps for teaching toward conceptual change. Once a student has internalized the skills for active listening, they are primed for engaging in an active learning process. The exhibition of this capability is limited by the child’s ability to understand or apply himself to the task. It stressed that researchers and educators have further identified active listening and its component skills as being transferred across disciplines. The ability to listen effectively affects students’ chievement in school, and contributes to the success in life.

Music among the multiple intelligences was found invaluable to develop student’s abilities in listening. Insofar as the power of reflective thinking is concern, musical intelligences are like philosophical, mathematical or scientific intelligence. Hodges (2000) outlines the five basic premises that have been derived from neuromusical research. These premises establish a link between the human brain, the ability to learn and the capacity for resilient health.

This research supports the long held supposition that music is beneficial to human beings. He states: (1) human brain has the ability to respond to and participate in music; (2) musical brain operates to respond at birth throughout life; (3) early and ongoing musical training affects the organization of the musical brain; (4) musical brain consists of extensive neural systems involving widely distributed, but locally specialized regions of the brain: cognitive components, affective components, and motor components. O'donell (1999) stated that Music from the baroque period causes the heart beat and pulse rate to relax to the beat of music. It affects the amplitude and frequency of brain waves, which can be measured by an electro-encephalogram. Music also affects breathing rate and electrical resistance of the skin.

It activates the left and right brain, thus, maximizes learning and retention of information. The information being studied activates the left brain while the music activates the right brain. In addition, he also find out that listening to baroque music before taking a test releases neurons in the brain which will help the body to relax. Its effectiveness can be seen by the results from an IQ test performed on two groups of college students.

The first group listened to Mozart music before taking the test. The second group did not listen to music before taking the test. The first group had an average of 119 while the second group had an average of 110 only. In addition, he stated that the key component of music that makes it beneficial is the order. The order of the music from the baroque and classical periods causes the brain to respond in special ways.

This order includes repetition and changes, certain patterns of rhythm, and pitch and mood contrasts. The brain works by looking at the different pieces of information and deciding if they are different or the same. This is done in baroque and classical periods by playing a theme and then repeating and changing the theme. The repetition is only done once. More than one repetition causes the music to become displeasing, and also causes the person to either enter a state of sub-conscious thinking or a state of anger.

Accordingly, the human mind shuts down after three or four repetition of rhythm, or a melody, or a harmonic progression. Zatorre (as cited in O'donell, 1999) children pay close attention to subtle variations in tone and timing, which enables them to learn language accent perfectly. Likewise, musical people have increased aptitude in foreign language learning due to an advanced ability in perceiving, processing, and closely reproducing accent. When the brain processes music, this function extends over both hemispheric regions.

The primary actuator in this connection is the acoustic cranial nerve which acts as a switching station for cranial nerves. In other words, the acoustic nerve channels not only sound from the ear, but also conduct other sensory inputs together, so our experience of the environment necessarily becomes a synthesis. Shaw and Bodner (as cited in Kliewer, 2003) included in their study the use of magnetic resonance imaging (MRI) to map the regions of a subject's brain that respond when listening to Mozart and Beethoven, and they found out that all types of music activates the auditory cortex, where the brain processes sound, and sometimes triggers parts of the brain that are associated with emotion. But with Mozart and Beethoven's music, the whole

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cortex is lighting up. Also, it activates areas of the brain involved in fine motor coordination, vision and other higher thought processes, all of which might be expected to come into play for spatial reasoning.

Lawrence (2001) found that several studies used instrumental soothing music tends to help accelerate learning. Examples include the composition of Mozart, Vivaldi, Bach and Handel. These instrumental pieces are called concentration music or relaxation music. Baroque music, with its unique rhythmic structure and stability, is particular conducive to memory, productivity and healthy, stress-free environments. Studies for accelerated learning showed that Baroque music was optimal for learning. This music also provides health benefits such as lower muscle tension, lower blood pressure, and a slower pulse rate.

Rauscher et al (1988) determined that listening to 10 minutes of Mozart's "Sonata for Two Pianos in D Major" briefly increased scores 48% (relative to control groups) on the paper-folding task, a component of the Stanford-Binet intelligence test that measures spatio-temporal reasoning abilities.

Moreover, the effects were transient, lasting only about 10 minutes, and performance on non-spatial reasoning tasks was unaffected. Such results seem to be unique to the music of Mozart, whereas music not as highly structured did not have measurable effects. Other researchers have demonstrated that compositions of other classical composers such as J. S. Bach show similar benefits.

Lozanov (1960) found that playing Baroque instrumental music (such as that of Handel and J. S. Bach) in the background while teaching foreign language

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vocabulary greatly increased student's speed of learning and degree of memory retention. Music with a meter close to 60 beats per minute was found to be most effective; that this rate closely matches that of a relaxed pulse is thought to be significant. Merrill (1991) got 72 mice and divided them into three groups: the hard rock group, the Mozart group, and the control group who had no music at all. He placed the mice in aquariums, and then started playing music 10 hours a day.

He put each mouse through a maze three times a week that originally had taken the mice an average of 10 minutes to complete. Over time, the 24 mice in the control group were able to cut about 5 minutes from their maze completion time. The Mozart mice cut their time back 8 1/2 minutes. The hard rock mice added 20 minutes to their time, a 300% increase in maze-running time from their original average.

Unfortunately, the study did not go for long because all hard rock mice killed each other. Hardie (1990) studied the effect of music on mathematics anxiety and achievement. Two different environments were used while students took an Intermediate Algebra exam. One group took the exam in silence, while the other group listened to background music during the exam. There was a significant increase in anxiety for the students tested in silence. Ruvinshteyn and Parrino (as cited in Orel, 2007) says research over the past 40 years, Baroque music pulses between 50-60 beats per minute and has been shown to enhance learning of foreign languages and to improve performances in some types of tests.

Because of this, the music has been widely marketed as a learning tool. The faculty members studied two groups of classes at Essex County College. In the first group, the instructor played baroque-style music in the background during the first semester. The second group, taught by the same instructors, was not exposed to music during class time.

After the first month, surveys showed that students who listened to music were more likely to enjoy class (86 percent vs. 76 percent) and less likely to find mathematics challenging (33 percent vs. 46 percent). Similar changes were noted in both groups regardless of which instructor taught the course. Preliminary results also indicated an improvement in student grades.

Weber (2007) stated that Baroque music accelerates learning and enhances both short-term and long-term memory. Physiological effects of Baroque music on learners includes lowering of the blood pressure slows heart beat, decrease of beta waves by 6% but increase of alpha waves by an average of 6%, and the right and left brain hemispheres of the brain synchronized. As the body becomes relax and alert, the mind is able to concentrate more easily. Mowesian and Heyer (1973) tested the basic arithmetic skills of tenth grade students under five different music style conditions: silence, rock music, folk music, classical-instrumental, and classical-vocal.

No significant mean exam score differences were found among the five music conditions. They suggested that “ because music or some other distracter so frequently accompanies participants’ studying, music may be assumed to raise their morale” (p. 108) and that music “ may make studying and test-taking less tedious, boring, and anxiety-producing” (p. 108).

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Wolfe (1983) researched the use of four volume levels of music while computing mathematics problems. Participants, 200 undergraduate non-music majors, were randomly assigned to 4 treatment groups. The groups were task only (no music), task plus background music at 60 - 70 dB, task plus background music at 70- 80 dB, and task plus background music at 80 - 90 dB. For the three music groups, the music consisted of four instrumental selections from motion picture sound tracks. The results indicated no significant difference in the number of problems completed by each group.

Also there was no significant difference in the number of math problems completed correctly among the four groups. The participants were given a questionnaire concerning the effect of the loudness on their ability to complete the task. More participants in the 80 - 90 decibel music group felt that the loudness of the musical selections seemed to interfere with computing the math problems. Theoretical Framework This study anchors on the theory of human intelligence developed by psychologist Howard Gardner who suggested that there are several ways of perceiving and understanding the world that allow individuals to find and resolve problems they faced. This also interrelates the theory of Burrhus F. Skinner and Edward C.

Tolman on the role of environment in learning. In 1983 Howard Gardner, psychology professor at Harvard University, presented his Multiple Intelligence theory based upon many years of research. Promoting the concept that intelligence is not one entity but that there are many different forms of intelligence, Gardner has awakened a revolution in learning.

Multiple Intelligence teaching methods recognize eight (though there may be more) forms of intelligence: visual-spatial, linguistic, logical-mathematical, <https://assignbuster.com/the-effect-of-baroque-music-on-the-performance-of-elementary-students-on-problem-solving-task/>

bodily-kinesthetic, interpersonal, intrapersonal, musical, and most recently naturalist.

Multiple Intelligence teachers strive to broaden students' familiarity and skill levels in each area. In introducing musical intelligence, Gardner first stands back and identifies its basic core of objective features: rhythm, pitch, harmony, and timbre, but he soon moves closer to dwell on the mysterious emotional power of music. He then presents several kinds of evidence to support his theory that musical ability functions like intelligence—what composers have called “logical musical thinking” and the “musical mind”. Musical abilities illustrate why Gardner rejects the simpler split-brain concept of mind.

Although most musical abilities are located in the right hemisphere, trained musicians are likely to draw upon the left hemisphere “in solving a task that the novice tackles primarily through the use of right hemisphere mechanisms”. The Multiple Intelligence teaching model emphasizes education for understanding rather than rote memory or the mimicking of skills. Practical hands-on skill development is coupled with factual knowledge and the ability to apply skills and information in real-life situations and make meaningful contributions to society. Development of the musical intelligence can be greatly aided by the use of music throughout the curriculum. In addition to learning about musical elements and how to create music, the musical intelligence involves developing an ability to respond to musical sound and the ability to use music effectively in one's life.

Edward C. Tolman (1886-1959), in his theory Sign/Purposive Learning indicates that cognitive processes are acquired relationships between environmental stimuli and responses. In his theory, the learner recognizes the significance of a stimulus and its different features. By following a series of recognizable signs toward a specific goal, learning becomes purposeful. His definition of stimulus is a perception, it is an environmental event that is processed by the organism, and definition of response is a learned behavior composed of performances.

Burrhus F. Skinner (1904-1990), his theory Instrumental Learning contends that the most significant human behavior falls under the general heading of operant behavior, which means that there are observable stimuli that lead to human action. His basic approach is a functional analysis of the relationship between observable behavior and the external variables that identify those elements of the environment associated with the occurrence of a behavior or a response. Manipulation of the environment is involved to produce the desired behavior.

Conceptual Framework Since learning is a function of the multiple intelligences inherent in the learner this study looks into the causal relationship between Baroque music and performance in Math problem task. It is said that music enhances the learning process. Figure 1 represent the conceptual framework of the study. Math Problem Solving ability is an aspect of the logical-mathematical and intelligence which could be affected by environmental stimulation such as the presence of Baroque music while doing a problem solving task. Gender and mental ability as possible factors

that may affect problem solving ability are considered as control variables to eliminate their influence on the dependent variable in the study.

Figure Figure I The Problem Research 1. What is the mean pretest score of the group exposed to Baroque music in the problem-solving task? 2. What is the mean pretest score of the group not exposed to Baroque music in the problem-solving task? 3. What is the mean posttest score of the group exposed to Baroque music in the Math Problem Solving task? 4. What is the mean posttest score of the group not exposed to Baroque music in the Math Problem Solving task? 5.

Is there a significant difference in the mean pretest scores between the groups exposed to Baroque music and the group not exposed to Baroque music? 6. Is there a significant difference in the mean posttest scores between the groups exposed to Baroque music and the group not exposed to Baroque music? Hypothesis The following hypothesis are tested in the study: 1. There is no significant difference in the mean pretest scores between the groups exposed and unexposed to Baroque music. 2.

There is no significant difference in the posttest scores between groups exposed and unexposed to Baroque music. Definition of Terms 1. Baroque Music- this term is associated with the era and the set of styles of European classical music which were in widespread use between 1600 to 1750. n this study it refers to the instrumental songs composed by Bach (Hapsichord Concerto in F Minor and Air on G String), Vivaldi (The Four Seasons), Albino (Adagio for Strings in G Minor), and Chopin (Nocturne for Piano No. 9).

2. Performance in Math- this phrase refers to the score obtained in the problem-solving task designed to measure mathematical ability. 3. Gender- refers to the sex of the person whether a girl or a boy. Significance of the Study This study is significant to parents because the results will give them information how Baroque music can help in enhancing the mathematical ability of their children.

Parents will encourage their children to appreciate Baroque music, and play it while reading, studying and doing homework. This also provides the teachers information that music is a powerful tool that they can use in the classroom to promote academic achievement and mental discipline. The intentional use of music in the classroom will set the scene and learning atmosphere to enhance teaching and learning activities. School administrators will know the necessary equipments to produce a better performance from their students. The recommendations made in this research are an attempt to find means and solutions to improve instructional facilities needed in subjects where Mathematics is concerned.

Chapter II Methodology Research Design This study will utilize an experimental design to investigate the difference in the mathematical problem solving performance of pupils exposed to baroque style of music and those who are not exposed. The pre-test posttest non-equivalent comparison groups quasi-experimental design will be the method of investigation. This design is illustrated bellow: Group 1 01 X03 Group 2 02 04The above diagram means that group 1 serves as the experimental group and receives the treatment (X). In this study X will be the baroque music.

Group 2 will be the control group and does not receive the treatment. 01 and <https://assignbuster.com/the-effect-of-baroque-music-on-the-performance-of-elementary-students-on-problem-solving-task/>

02 correspond to the pretest while 03 and 04 correspond to the posttest of the control and experimental groups.

Population and Sampling Procedure The total population of the Grade Six pupils of Zamboanga City Polytechnic State College is 34 and composed of only one section. Two groups will be used as respondents of the study, one for control and one for experimental. The assignment as to which one will be experimental or control will be done be random. Total enumeration will be used for the number of pupils in the class. **Instrumentation** An objective type of Math Achievement Test will serve as the instrument to measure Mathematical performance of Grade Six pupils.

This will be administered at the start and end at the experimental sessions. Before the administration of the test the self-constructed Math test will be submitted to a panel of experts. **Methodological Limitation** This study is limited to the investigation of the effect of Baroque music to Mathematics Problem Solving test of the Grade Six Pupils of Zamboanga City State Polytechnic College, located at Baliwasan Chico, Zamboanga City. **Data Collection Procedure** A. Pre-experimental Phase Permission will be sought from the principal of the Elementary school of Zamboanga City State Polytechnic College to allow the researches to conduct the study.

Preparation of the materials such as CD player and the disc containing the song/entitled Harpsichord Concerto in F Minor and Air on G String, The Four Seasons, Adagio for Strings in G Minor, Nocturne for Piano No. , which are Baroque style of musical copies of test instrument. Setting the classrooms that will be used in the conduct of experiments. The classroom setting shall

be arranged in such a way that quiet, well ventilated and well-lighted conditions prevail. Discuss and orient with the Math teachers who will serve as confederates of the researchers.

They will be briefed on the purpose and mechanics of the research project. This will be done after Math teachers consent to the proposal. B.

Experimental Phase The experiment will begin upon opening the school year 2007-2008. The duration of the experimental will be for four weekly class sessions in Math subjects.

The assignment as to which class will receive the treatment or serve as experimental groups and control group will be done by random. At the start of the experiment, the Math Achievement Test will be administered to both groups. Results of the test will serve as the pretest component of the experiment. Control Group Condition After the pretest has been conducted, the Math problem solving tasks of Math shall be done without background music. After four weeks a Math Achievement Test will be administered as posttest measure. Experimental Group Condition For this group, Math Problem Solving Task shall be done while baroque music is being played as background music.

Data Analysis Procedure Data gathered from the study will be quantitatively analyzed through the use of descriptive and inferential statistics.

Computation of the pretest posttest mean scores in the Math Achievement test will be conducted. Mean differences in the pre-test posttest Math Achievement scores between the experimental and control group will be analyzed using t-test.