

## APPLYING OPERANT CONDITIONING IN PREPARING STUDENTS FOR MUSIC TESTS: A CASE STUDY OF ZION SECONDARY SCHOOL, NNOBI

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### Abstract

The use of rewards in teaching and learning has been generally acclaimed to be of great impact in various disciplines, the study of music inclusive. Scholarly, rewards as applied in teaching and learning has been debated to either be completely positive or negative. This paper however, discussed the positive impacts of operant conditioning in preparing students for music tests using Zion Secondary, School, Nnobi as a case study. The study adopted a survey approach using ten selected students as a pilot study which was further divided into two different groups, (A) and (B) as experimental and control groups. The library, interviews and observations were used as sources of information. The findings of the study were reported on the analysis pages. The study established and concluded that the application of positive rewards motivates students in preparing for tests in music as well as in teaching and learning generally. It was recommended that material and verbal rewards be employed in teaching and learning to motivate students in performing positively in their academic pursuits. The study suggests that further researches be carried out by other interested scholars in other secondary schools to authenticate the outcome of this study.

### Introduction

The reliability of test is usually said to be a measure of the extent to which a test consistently measures what it intends to measure. Operant conditioning as propounded by skinner in the context of this paper has been put to trial to ascertain its relevance towards goals in music studies. The attitude of teachers towards the use of positive rewards in teaching and learning is dwindling specially in the aspect of musical studies which this paper seeks to address. It is the hope of the researcher to remind teachers and educational stakeholders the need to emphasize and constantly use positive rewards in motivating students in the study of music especially in preparing students in classroom tests.

It is the aim of the researcher to find out whether the use of reward in preparing music students for tests can actually be positive in influencing their academic performances. The researcher who had taught music for some years observed that students face difficulties in studying music. To find out how to motivate students in overcoming the challenge of studying music, he applied the operant conditioning method propounded by Skinner and confirmed that students can do well in music when they are positively rewarded. This paper is a survey study which seeks to find out the extent the use of operant conditioning (rewards) has motivated the selected ten JSS 1 students of Zion

Secondary School, Nnobi in understanding the subject music and passing music tests. It was the intention of the researcher to find out if operant conditioning theory could be applied in all situations of teaching and learning with particular reference to the study of selected topics in music as shown in the analysis pages at the end of the study. The school studied was a mission secondary school owned by St. Paul's Anglican Church, Nnobi. The researcher through random sampling selected ten JSS 1 students of the above-named school as his population sample. After administering an on-the-spot Performance Based Test to ascertain their entry behavior, he further sub-divided the students into two different groups A, (the experimental group) and B, (the control group). The white board, marker, music manuscripts and cardboard sheets were used as major instructional materials. The researcher personally taught the class for the period of 45 minutes on each contact two times a week for the period of one term. Specifically with regards to this investigation, the researcher used verbal praises, exercise books and monetary gifts as the material rewards used in the study.

### **Methodology**

This study centers on the JSS 1 students of St. Paul's Anglican Church, Nnobi in Idemili South Local Government Area in Anambra State, Nigeria. To gather the required information necessary for this study was a problem because music has not been taught in the school as a subject since inception. Again, bringing together the selected students for the essential information was also a problem hence the researcher was only allowed to carry out his research during the prep hours after school. The research adopted survey design method in carrying out this research. Data collection was through interview, participant observation and the use of the library. The population sample comprised of ten selected students and the school principal from whom the brief history of the school was gathered.

### **Brief Historical Background of Zion Secondary School, Nnobi.**

Zion secondary school, Nnobi is a mission secondary school owned by St. Paul's Anglican Church, Nnobi in the Diocese on the Niger (Anglican Communion). The school was founded in 2014. The pioneer principal was Mr. Thompson Oladimeji (a youth corps member). The second as well as the incumbent principal at the time of this research was Mr. Ifeanyichukwu Nwosu. The Rev. Matthew Chukwuneme was the school administrative manager as at the time of this research while the Rt. Rev. Dr. Owen C. Nwokolo doubled as the Diocesan bishop as well as the school proprietor. At the time of the study, the school has the total of 180 Students with the JSS1 students under study 42 in number. The numerical strength of the teaching staff was as follows:

Full time teachers =10

Part time teachers = 5

Teaching Practice teachers =4

From inception to the period of this research, music was not taught as a subject in Zion Secondary School, Nnobi. Because of the shortness of time accrued to this research, the researcher decided to randomly select 10 students of JSS 1 of the school to make for easy coordination and possible reliable outcome of the result findings.

### Concept of Operant Conditioning

Operant conditioning simply put is the act of using positive reward in motivating students to learn. The use of reinforcement in arousing the interest of learners has been an age long tradition. However, educational psychologists have argued on various learning theories that can positively influence learning better than the other. Struggling to find the most effective method of motivating students to learn, some educators turn to the system of punishment and rewards which up till date are not exhaustive in solving the problem. Punishment can be seen as practical solution through which students are forced to learn, e.g. studying, doing their home works, behaving well in class, being prepared for class tests, among other desirable behaviors required for effective learning that can lead to positive academic performance. Rewards on the other hand, can produce students who are only interested in the reward rather than the learning itself. Nevertheless, with the use of positive reinforcement, a classroom can be well managed. Ross (2009), explains:

One kind of learning occurs when a child's actions are followed by a reward or punishment. A reward, also called reinforcement increases the probability that behavior will be repeated. For example, a young child may regularly draw pictures because she receives praise from her parents after completing each one. A punishment decreases the probability that behavior will be repeated. For example, a child who touches a hot stove and burns his fingertips is not likely to touch the stove again. (Retrieved 8, August 2019, from <https://doi.org/10.1177/014662168000400406> )

An American Psychologist B.F. Skinner devoted his career to clarifying how human behavior is affected by its consequences. He called this process "operant conditioning." To him, students can be motivated to learn and do well in class tests when they are positively rewarded. This was against the past generations when it was acceptable for teachers to use corporal punishments on students who misbehaved or unprepared for class tests. Despite the fact that the contemporary society and the government discourages corporal punishments in schools, Hyman (1990) defines corporal punishment as "the infliction of pain or confinement as a penalty for an offense committed by a student" (p. 10). Ellen (1998) opines "while there are many systems available to provide for a well-managed classroom, some are more effective than others..." (Accesses 17/7/2021 from [ematusov.see.udel.edu](http://ematusov.see.udel.edu)). Based on the above assertion, the researcher investigated ten JSS one students of Zion Secondary School Nnobi through random sampling. It is his intention to discover whether the use of rewards (operant conditioning) will be very effective in preparing the experimental group in doing better than the control group at the end of the research. Explaining the employment of operant conditioning in teaching and learning, McLeod (2018) explains:

Operant conditioning, also known as instrumental conditioning normally attributed to B. F. Skinner, where the consequences of a response determine the probability of it being repeated. Through operant conditioning behavior which is reinforced (rewarded) will likely be repeated, and behavior which is punished will occur less frequently."

(Accessed 20/7/2021 from <https://WWW.simplypsychology.org/operant-conditioning.html>).

Since the study of music could be effectual with the use of positive rewards, the need to try its efficacy in this research becomes imperative. The researcher has therefore embarked on the study regarding the above subject matter and reports the results of his findings in the analysis pages. Having the above definition in mind, the researcher has gone deep to find the educational implications of reward in relation to the academic performance of the music students in the aforementioned school.

### **The Effects of Operant Conditioning on Music Tests**

Writing on educational implication of the Operant Conditioning, Onwuekwe (2019) explains:

Generally, the learner must do or operate in order to learn. In a music classroom situation for instance, the learner must actually play the keyboard in order to learn. A trumpeter who is learning must handle the trumpet; a clarinetist must play the clarinet; a saxophonist must play the saxophone in order to learn. In the same vain, a dancer must dance, a singer must sing in order to learn. When the learner performs appropriately, she will be rewarded or reinforced positively; but if the learner behaves inappropriately, it will be reinforced negatively. In Skinner's experiment, the concept of reinforcement is illustrated and emphasized. It is also noteworthy that reinforcement depends upon the activity or the response of the learner. (p. 67).

Considering the above, it could be said expressively that reinforcement is dependent upon response. Skinner's experiment on reinforcement showed that positive rewards enhance learning. In music classroom, effective learning can take place when the students are motivated with both material and non-material rewards like verbal praises etc.

### **Concept of Test**

Okoye (1996) in Onwuekwe (2017:1) defines test as "a process of exposing an individual to set of questions, tasks and statements in order to obtain scores." In a broader sense, Onwuekwe (2017) further said:

A test can be defined as a set of questions, tasks or statements that can be presented to an individual, response to which would enable the tester establish how much of a desired characteristic is possessed by the teste. When defined as above, tests may include aptitude, achievement and personality tests. Personality test here stands for all devices for assessing non-cognitive characteristic. These tests are referred to as achievement, aptitude and non-cognitive measures. (p. 9).

Schnitzer (2009) in his own contribution states "Psychological testing is a measurement of some aspects of human behavior by procedures consisting of carefully prescribed content, methods of administration and interpretation... (Retrieved 8<sup>th</sup>, August 2018 from <https://www.ncbi.nlm.nih.gov/books>)

Bringing the above definitions to a narrower sense, the researcher views tests as those measures that comprise questions or tests, which can have literally correct or incorrect

answers. The history of testing as we have it nowadays is imbedded in the need for practical procedures for solving public problems. In 1905, the first useful intelligent test was developed by the French psychologist Alfred Binet and Theodore Simon. They developed a 3C item scale to ensure that no child was denied instruction in the Paris school system without formal examination (tests). (Retrieved 8<sup>th</sup> August 2018 from <https://www.ncbi.nlm.nih.gov/books/>).

### Uses of Tests

Tests are used by various bodies like the clinics or hospitals where tests are administered for purposes of diagnosis and treatment planning. The industrial and organizational settings use tests primarily for selection and classification. In the former, tests are used to specify the types of positions for which an individual seems best suited. For example, Schnitzer (2009) explains:

In educational setting however, various kinds of tests are administered to assess students' accomplishment and to improve instruction and curriculum planning. For instance, achievement tests are designed to assess current performance in an academic area because it is viewed as an indicator of previous learning determinant which is often used to predict future academic success. Aptitude tests predict future performance in area of interest in which an individual has not yet to be trained. Intelligent tests in contrast to tests of specific proficiencies or aptitudes appraise the global capacity of an individual to cope with the environment; interest inventory tests offer a frame for narrowing career possibilities. Objectivity personality tests measure social and emotional adjustment and are used to identify the need for psychological counselling while the projective techniques tests are based on the phenomenon of projection, a mental process described by Sigmund Freud as the tendency to attribute to other persons feelings or characteristics that are too painful to acknowledge. (Retrieved 8<sup>th</sup>, August 2018 from <https://www.ncbi.nlm.nih.gov/books/>).

In her own contribution, Onwuekwe (2017) opines:

Tests serve different functions to those who use them, the teacher uses tests to know how much of the course content the student has learned... the student entry behavior to a new topic... grouping students according to their abilities for effectiveness of teaching... goal setting and achievement of goals as well as identification of curriculum areas to be revised... Tests help to motivate students to learn, develop good study habits, identify their strength and weakness, make vocational choice as well as in subject selection (p. 6).

It is important to note that "if for example, students of a particular teacher consistently do well, it could be inferred that such a teacher is an effective one. Parents use test scores as a feed back to know their children's academic performances. This will help them guide them academically as well as guide them properly in their future careers. Remedial programs could be arranged for extra tutorial classes for their children in subjects

where they are weak. Researchers can as well lay their hands-on ready-made tests as instrument for data collection. Again, test scores are also relied upon in ex-post facto researches. For instance, if a teacher wishes to study the trend of performance in school certificate music, he does not start afresh to administer music tests over a period of time. What he rather does is to collect the scores of students in past music school certificate examinations and from the available results draws his conclusion.

### **The Music Teacher and how he effectively Impacts Knowledge**

Ekwueme (2001) in Ajewele (2015) explains:

A music teacher is a qualified person professionally trained, certified and well prepared to teach music in the school system. He is trained to equip students/learners with musical knowledge, skills, attitudes and values that will make the student good consumers and producers of music and also contribute to the development of his/her society (p. 15).

Okonkwo (2010) states "music educators face problems in adopting appropriate teaching techniques to impact music knowledge to many students of music in Nigeria because of their untutored background from earlier age (p. 125). Ojukwu, & Onuora-Oguno (2015) in their input observe:

The teaching and learning of music in Nigeria secondary schools has been through many problems. Often times, music teachers complain of inattentiveness and waning interests of the students in music. One major cause of the problem pointed out by many researches is the poor teaching methods used by the teachers in transmitting musical knowledge. (p. 35).

The researcher rightly took note of the points made by the above-named scholars that "storytelling, project, demonstration, lecture, discussion, dramatic and field methods are conventional methods of teaching in the educational system of Nigeria." These methods could be adopted by teachers to effectively enhance learning. He however, narrowed his points down to those activities that motivate students in preparing them for music tests in the classroom. It may be necessary to mention here that positive reinforcements (rewards) are keys to making students ready for music tests (examinations). The researcher being aware of both negative and positive rewards has pin-pointed positive reward as the major reinforcement that mostly motivates students in doing well during music tests. However, Okafor (2005) says "the teacher had to be taught to teach and he had to know how to deliver the information and how to impart knowledge" (p. 305).

### **Learning**

Talking about how to reinforce music students in other to do well during classroom tests will be incomplete without making mention of learning. A student can only do well in music class only when he learns. Ezeanolue (1982) in Onwuekwe (2017) has define learning as: An adaption to the environment... being able to adjust to the environmental desirable characteristics of learning... as a mental process, before an individual learns, he must first think... as an acquisition of knowledge, skills and attitude... the learner must have registered some facts, skills and attitudes in his/her term memory... As a modification of behavior... an undesirable behavior or idea can be regulated to suit life changing

pattern..., learning is an elimination of errors that may be encountered. With effective learning taking place, these errors gradually decrease. (pp. 2-5).

However, many psychologists according to Ezeanolue (1982) in Onwuekwe (2017) explains that "learning is a relatively permanent change in behavior resulting from activity, training and experience." (p. 3.). In furtherance of the above, Mbanugo (2006) defines learning as "Growth, development and experience". (P. 41). Researches carried out on human learning have led to theories about how individuals learn and how learning could be best achieved. The researcher recognizes various studies embarked upon by the early educational psychologists. These psychologists came up with learning processes such as "sensation" meaning that the learners should be stimulated through one or more of the senses of sight, taste, smell, hearing and touch. "Perception" stimulations that lead to turning an individual's attention to a particular situation of interest, aims, needs and aspirations. Psychologists posit that learning begins at the point of perception hence a period of clearer attention and concentration. "Association" means that, the learner relates present situations to past experiences in order to facilitate understanding of the new situation i.e. (from known to unknown). "Generalization" at this point, the learner draws up some conclusions that serve purposes beyond a particular situation. "Application" means a general statement which has been made on a particular situation which can be applied to a new but similar situation.

Nye and Nye (1972) and Leonard and House (1972) in Mbanugo (2006) have developed principles of learning especially applicable to problems in music education, issues of planning and sequencing of musical learning have been well articulated by Glenn and Turrettine (1968) in Mbanugo (2006, p. 41).

### **Report of the Findings**

It is not enough to assess students' knowledge and skills at the end of the course or program. The teacher needs to find out what they know prior to the introduction of the course (entry behavior). This is to identify more specifically the knowledge and skills they have gained during the course or program. In this particular study, the researcher used the "performance-based prior knowledge assessment to determine the entry behavior of the selected 10 students" before embarking on his actual research. Performance-based prior knowledge assessments are the most reliable way to assess students' previous knowledge. It involves assigning a task (e.g., quiz to test their knowledge on a subject matter). Those assessments are for diagnostic purposes only and they should not be graded. They can help you gain an overview of students' preparedness, identify areas of weakness, and adjust the pace of the course. The table below shows the researcher's performance-based assessment on the selected 10 JSS. 1 students of Zion Secondary School, Nnobi on his first visit.

DAY 1: Tuesday

Date: 10<sup>th</sup> September, 2019.

Table 1

Number of Students	Topic: Musical Notes and Values	Number of Minutes	On the Spot Test Scores (%)	Rewarded?
1.		45mins	0	No
2.		45mins	0	No
3.		45mins	0	No
4.		45mins	0	No
5.		45mins	0	No
6.		45mins	0	No
7.		45mins	0	No
8.		45mins	0	No
9.		45mins	0	No
10.		45mins	0	No

The table above shows that the total number of 10 students who had not been exposed to music as a subject for the first time were given a "performance-based prior knowledge assessment to test their entry behavior on musical notes and their values. The test lasted for 45 minutes. The 10 Students were not reinforced with any kind of motivation (reward). No Student could spell out the note values correctly hence the 10 of them scored very poorly. Reward had no effect on any Student because none was rewarded. The findings from the above results show that none of the 10 Students had prior knowledge of musical notes and their values, hence their poor performances.

In furtherance of the study, the researcher divided the ten students into two groups comprising of 5 students in the group A, the experimental group, and 5 students in group B, the control group. After sharing the class into two through random selection, he taught them three topics two times a week to ascertain the extent the use of positive reward could improve the performance of the rewarded group. The following topics were taught: "musical notes and values, "simple rhythmic patterns" as well as "sight singing simple melodies." These two groups were taught differently to avoid a particular group knowing what others were doing in their own class. To ascertain the effectiveness of positive reward in teaching and learning, the researcher administered on the spot class tests immediately after every lesson period that lasts for 45 minutes on each contact. To make for clarity, every class test was scored over 10 percent. The tables below clearly show the analysis of performances of the selected ten students shared into two groups. Students of group A, (the experimental group) were reinforced with positive rewards while the students of group B otherwise known as the control group were not reinforced at all.



DAY 2: Thursday

Date: 12<sup>th</sup> September, 2019.

Group A. Table 2.

Number of Students	Topic: Musical Notes and Values	Number of Minutes	On the Spot Test Scores (%)	Rewarded?
1.		45mins	7	Yes
2.		45 mins	6	Yes
3.		45 mins	8	Yes
4.		45 mins	8	Yes
5.		45 mins	5	Yes

After the first day, the class of 10 was divided into two groups A and B. The choice was through random selection. On the first day of independent teaching in groups, the researcher taught the students musical notes and their values which was followed immediately with a class test. The table above shows the performances of the rewarded students (Group A).

Group B. Table 3.

Number of Students	Topic: Musical Notes and Values	Number of Minutes	On the Spot Test score (%)	Rewarded?
1.		45 mins	4	No
2.		45 mins	3	No
3.		45 mins	2	No
4.		45 mins	4	No
5.		45 mins	3	No

The table above shows the performances of the students of the control group (B) performing poorer than the rewarded group as shown in table 2 above. They were taught the same topic within the same period of 45 minutes under the same school atmosphere.

DAY 3: Monday

Date: 16<sup>th</sup> September, 2019.

Group A. Table 4

Number of Students	Topic: Simple Rhythmic Patterns	Number of Minutes	On the Spot Test Scores (%)	Rewarded?
1.		45 mins	7	Yes
2.		45 mins	7	Yes
3.		45 mins	9	Yes
4.		45 mins	9	Yes
5.		45 mins	6	Yes

The table above shows improved performances of the students of group (A) having been rewarded for the second time after the class lesson.

Group B. Table 5

Number of Students	Topic: Simple Rhythmic Patterns	Number of Minutes	On the Spot Test Score (%)	Rewarded?
1.		45 mins	4	No
2.		45 mins	4	No
3.		45 mins	5	No
4.		45 mins	5	No
5.		45 mins	4	No

Table 5 above shows the performances of the students of the control group (B).

DAY 4: Wednesday

Date: 18<sup>th</sup> September, 2019.

Group A. Table 6

Number of Students	Topic: Simple Rhythmic Pattern	Number of Minutes	On the Spot Test Score (%)	Rewarded?
1.		45 mins	8	Yes
2.		45 mins	7	Yes
3.		45 mins	10	Yes
4.		45 mins	10	Yes
5.		45 mins	7	Yes

The table above depicts the performances of the rewarded group (A) who were motivated for the 3<sup>rd</sup> time. The analysis shows much improved performances by the students because they were being reinforced with rewards.

**Group B. Table 7**

Number of Pupils	Topic: Simple Rhythmic Pattern	Number of Minutes	On the spot test scores under 5 (%)	Rewarded?
		45 mins	5	No
		45 mins	5	No
		45 mins	4	No
		45 mins	4	No
		45 mins	5	No

The table above shows the performances of the students of the control group (B) poorer than those in group (A) who were motivated with rewards.

**DAY 5: Friday**

**Date: 20<sup>th</sup> September, 2019.**

**Group A. Table 8**

Number of Students	Topic: Sight singing of simple melodies	Number of Minutes	On the Spot Test score (%)	Rewarded?
1.		45 mins	8	Yes
2.		45 mins	8	Yes
3.		45 mins	10	Yes
4.		45 mins	9	Yes
5.		45 mins	8	Yes

The scores above show the performances of the rewarded students of group (A) still outperforming the control group B which was not rewarded.

Group B. Table 9

Number of Students	Topic: sight singing of simple melodies	Number of Minutes	On the spot test score (%)	Rewarded?
1.		45 mins	6	No
2.		45 mins	5	No
3.		45 mins	4	No
4.		45 mins	4	No
5.		45 mins	5	No

The table above shows the non-reinforced group (B) still performing lesser than the rewarded group (A) as shown in table 8 above.

DAY 6: Monday

Date: 23<sup>rd</sup> September, 2019.

GROUP A

Group A. Table 10

Number of Students	Topic: sight singing of simple melodies	Number of Minutes	On the spot test score (%)	Rewarded?
1.		45 mins	9	Yes
2.		45 mins	9	Yes
3.		45 mins	10	Yes
4.		45 mins	10	Yes
5.		45 mins	9	Yes

The table above shows the performances of group (A) students who are rewarded still performing better than the non-rewarded group (B) students.

Group B. Table 11

Number of Students	Topic: sight singing of simple melodies	Number of Minutes	On the Spot Test score (%)	Rewarded?
1.		45 mins	6	No
2.		45 mins	6	No
3.		45 mins	5	No
4.		45 mins	5	No
5.		45 mins	5	No

The table above shows the poor performances of the non-rewarded group (B) as against the rewarded students of group (A). The above exercises continued within the period of seven weeks that make up a term. The results consistently showed improved performances by the rewarded group with the non-rewarded group steadily performing poorly.

### Conclusion

The researcher discovered that the 5 students in the reinforced group positively performed well in music tests. They showed interest in the study of music because they were regularly with the gift of money and other material items such as exercise books, music manuscripts and verbal praises. This shows that operant conditioning is a positive way of motivating students to learn especially as it concerned the selected JSS 1 students of Zion Secondary School, Nnobi. The result of this study vividly shows that almost all the 5 students in the experimental group improved in their learning of music following the rewards given to them by the researcher. This made them to continuously outperform their non-reinforced opponents in group B. On a general analysis therefore, the results of the finding in this study strongly agrees with the operant conditioning theory by Skinner which states "learners perform better when they are positively rewarded". The researcher discovers that in a situation where he used the use of positive rewards in teaching, the motivated students learned and performed academically well. Based on the above finding, the researcher makes the following recommendations.

### Recommendations

1. Proper training to be given to music educators to develop the required potentials in imparting musical knowledge to their students especially in such subjects like music which many occasions, students meet for the first time in their JSS 1 or even some times in their higher educational levels.
2. Individual secondary school music teachers should be empowered by the government and school administrators especially in the privately owned secondary schools like Zion Secondary School, Nnobi. If this is done, the music teachers will not lack enough material rewards with which they will be motivating students in learning music.

3. Rewards in music education should be encouraged by education administrators of all levels to enable for improved academic performance especially in the study of music in Nigerian secondary schools.

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