



# “Science Pop-Tunes”: A Teaching Strategy in Enhancing Students’ Academic Performance

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## Abstract

The study is all about incorporating music (science pop-tunes) in teaching science subject and observing its effect on the academic performance of the participants. 44 grade 9 pupils divided into control and experimental groups participated in the study. The study used quasi-experimental research design and data retrieval technique. Data analysis involved the use of frequency count, mean, standard deviation and t-test. Results revealed that the pre-tests of both groups were the same and the test of difference was found not significant. On the contrary, the result of post-test of both groups yielded gain scores to both group of participants. However, the experimental group had a significantly higher mean in the gain score. The result exhibited that the intervention significantly improved the academic performance of the science students. Hence, teaching science lessons to pupils through the traditional learning method had a minimal effect in improving pupil’s academic performance while integrating science pop-tunes combo during the course of instruction significantly displayed better academic performance.

## Subject Areas

Education

## Keywords

Science Pop-Tunes, Academic Performance, Interdisciplinary Approach, Teaching-Learning Process, Multiple Intelligences

## 1. Introduction

Music is everywhere. It has a universal appeal. It can bridge intergenerational gaps for its meaning and essence that captivates everyone’s interest. For some, it is an expression of one’s emotion, portrayal of one’s thinking and state of mind.

Moreover, it is also a form of relaxation and a way to lessen stress from a loaded day of work and pressure-packed school requirements. Bearing in mind the nature of music, the researcher believes that music could do more than entertaining people, young or old, and even students; that music could somehow benefit students in terms of their academic performance. Of these, the researcher has come up with the idea of integrating music in some lessons wherein it would serve as a motivational activity and/or could also be used in generalizing the lesson. Hereafter, the researcher seeks to conduct the study, particularly, with science pop-tunes as a strategy in enhancing students' performance. Yet, in spite of the thought-provoking nature of the study, few scholars had been doing works to it; hence, notwithstanding the limited literatures about the research study, the researcher offers the subsequent writings.

One of the challenges faced by teachers nowadays is to think of a strategy that will suit the students' learning styles. Of this, teachers must be aware that they need to be innovative. As cited by [1] [2] said that awareness is knowledge and knowledge is power. Correspondingly, as cited by [3], according to the author in [4], teachers should be creative in their thinking and in their approach. An innovative educator is very uncomfortable with doing business as usual, especially when it yields no result. So, they go to work brainstorming ways to make things better. Accordingly, utilizing varied and innovative techniques, like incorporating music, would make the teaching-learning process a fun-filled activity. Today's age enables an innovative teacher to develop their teaching learning strategies thought the comfort of technology; hence, improving the learning capacity of students through music and technology is possible. According to the research of [5], the implementation of music as a teaching strategy has given the students' knowledge on the subject-matter and participation in increased class activities. Also, researchers in [6] held that brain responds differently to music, and that music and songs can be effective mnemonic devices for facilitating student engagement. In the same way, the author in [7] stated that music aids memory because the beat, melody, and harmony serve as carriers for the semantic content. This is why it is easier to recall the words in a song than in a conversation. Furthermore, music also provides a helpful mnemonic for verbal learning throughout life and most notably during early development and in educational settings. Similarly, the study of [8] revealed that songs are enjoyable in the classroom; because of these lower stresses, and boredom levels, students tend to understand and retain key information better.

Music is a cognitive activity that could be used creatively as another method in the teaching-learning process that contributes in improving students' performance and may continuously help the students in developing and improving their problem solving and critical thinking skills [9] while enjoying the lesson.

Similarly, the author in [10] said that the concept of music as a whole brain experience is also underpinned by neurological studies showing that many different regions of the brain can be employed in processing musical stimuli. Likewise, the observation of [11] proved that one aspect of brain functioning is

brain-wave frequencies. The four types of waves-delta, theta, alpha, and beta relate to various levels of consciousness where the alpha and beta wave types have particular implications for music. Alpha waves occur when students are in a relaxed state of awareness. When slow, *i.e.* minor key music is being played, it relaxes the brain which can be useful when reviewing content so that it passes into the long-term memory. On the other hand, beta waves are the patterns of a fully awake mind, when the left hemisphere kicks into action. This is multitasking mode for the next generation, when they are functioning at optimum speed. Fast, up-tempo, major-key music can snap to attention students who are in a drifting alpha or meditative theta state, leaving them super alert and ready for whatever activities the teacher has planned. Also, [12] stated that combining melody and lyrics provide multiple neural pathways to store, access, and retrieve memories. When two events are linked together in memory, the recall of one prompts the other. He also stressed out that humor, stories and songs are all excellent devices for captivating emotional response, getting attention and encoding multiple neural connections. The authors in [13] concluded in their study that there is a great potential for educators to improve instructions based on neuroscience, and encourage teachers to begin developing strategies and techniques utilizing current findings from neuroscience.

Integrating songs in teaching science showed positive effects. According to [14], using science-content songs have relevance from a constructivist approach as it can help students construct the meaning of science concepts. Moreover, songs also have socio-cultural perspective in terms of student engagement and also from a cognitive perspective as students are able to make connections in learning. The researcher in [15] describes a curriculum program developed by Columbia College in Chicago that employed an arts-enriched approach to learning science for all levels of students, and results showed that students' achievement is higher and they show greater interest. In support to the preceding findings, the authors in [16] stated that many students feel out of place in science classes but enjoyable music could help students perceive the science classroom as a friendly environment in which they belong. According to [17] and [18], songs can also be played at any point in the learning process and can be the focus of the lesson or used as supplement to enhance and enrich learning. [18] therefore, recommended that songs which have an easy-to-sing melody must be selected and be heard by students more than once to emphasize key points. Finally, the study of the researchers in [19] found out that science content music provided analogies and insights to help students build networks of understanding the final stage of instruction. Furthermore, when used effectively, music can help facilitate the process of conceptual change during several steps in the instructional sequence.

In view of the aforesaid writings, there seems to be a limited study in terms of incorporating music to teaching science subject. Also, there were no similar tones of researches conducted in the Philippine. Thus, this study is conducted

either to further cement or contradict previous research findings. More so, the study specifically involved students in the Philippine locale. Explicitly, the study sought to answer the following specific problems, to wit:

1) How may the level of science performance of the student-participants be described based on the pre-test and post-test results using Traditional Method?

2) How may the level of science performance of the student-participants be described based on the pre-test and post-test results using Science-Pop Tunes combo?

3) What significant difference may occur on the gain scores based on the science pedagogy using Traditional Method and Science-Pop Tunes combo?

### **Hypothesis of the Study**

There is no significant difference occurring on the gain scores based on the science pedagogy using traditional method and science-pop tunes.

## **2. Methodology**

This research utilized the quasi-experimental research using pre-test and post-test method and data retrieval technique. It also used descriptive research method because as cited by [20], the author in [21] said that the method can systematically describe a situation, problem, phenomenon, service or programs, or provides information or describes the attitude towards an issue. This study was conducted from Academic Year 2017 to 2018. There were 44 participants from Grade 9 students of Baloy High School, Cuyapo, Nueva Ecija which were divided into 22 Control (students who were taught using the traditional method) and 22 experimental (students who were taught using the science pop-tunes combo) groups based on their Grade 8 final grades in Science to ensure homogeneity in academic potential and to avoid extraneous variables. Both groups received the same pre and post-test assessments. The main gathering instrument was through the use of multiple-choice assessment items for the pre-test and post-test administration. Further, the instrument was pre-tested to 30 Grade 9 students. The instrument was found valid and reliable with coefficients of 0.84 and 0.86, respectively through Cronbach's alpha. Furthermore, consent to conduct the study from Schools Division Superintendent and principal of the High School was sought. Moreover, for confidentiality purposes, the names of the participants were not reflected; hence, the results were reported as a whole and in general terms. The author/composer also of the songs used in the study was informed regarding the utilization. Lastly, data gathered from the study on the level of performance of the participants in science based on the selected science pedagogic methods were analyzed through frequency count, percentage, mean, and standard deviation while on the determination on the difference in gain scores (difference between the post-test and pre-test obtained by each participant; measured using ratio scale) based on traditional and science-pop tunes combo (combination of pop songs substituted by science lyrics), the two-directional t-test was used.

### 3. Results and Discussions

#### 1) Level of science performance of the student-participants based on the pre-test results using the two strategies in teaching the subject in terms of traditional method

It could be seen from **Table 1** that results of the pre-test of both groups were the same. It suggests that the level of science performance of the two groups before the intervention was done was equal ( $C_R$ : 17.59;  $E_R$ : 17.59) the difference of 0.00 was observed. Hence, the control and experimental groups of students prior to the intervention are homogeneous, the dispersion ( $sd$ :  $C_R = 4.393$ ;  $sd$ :  $E_R = 3.762$ ) being narrow. It also implies that the two group of participants are purposively distributed to ensure homogeneity at least on the issue of Grade 9 pupils' performance in science. According to [22], traditional method of teaching reinforces habits of passive and dependent learning which are considered as not effective because students are not given the opportunity to discuss and debate their answers with peers in an attempt to work through and improve their understanding.

#### 2) Level of science performance of the student-participants based on the post-test results using the two strategies in teaching the subject in terms of utilizing science pop-tunes combo

**Table 2** shows evident results after the intervention was applied. Post-test results yielded gain scores to both groups of participants. On the basis of data, the control group (traditional method) had a mean gain score of 25.14 while the experimental group made a remarkable improvement with a gain score mean of 32.41. Findings indicate that there is a difference on the grasping of knowledge by and between those pupils in the control and experimental group. The findings further emphasize that pupil-participants (experimental group) had an improved retention of facts and concepts and are superior in applying the knowledge they gained. In congruence thereto, the authors in [5] said that, implementation of music as a teaching strategy has given the students' knowledge on the subject-matter and participation in class activities increased. Also, [6] held that

**Table 1.** Results of the pre-test using traditional method of teaching.

Group	N	Mean	sd
Control	22	17.59	4.393
Experimental	22	17.59	3.762
<b>Total</b>	<b>44</b>		

**Table 2.** Results of post-test using traditional and science pop-tunes combo.

Group	N	Mean	sd
Control	22	25.14	4.950
Experimental	22	32.41	5.836
<b>Total</b>	<b>44</b>		

brain responds differently to music, and that music and songs can be effective mnemonic devices for facilitating student engagement. In the same way, [7] stated that music aids memory because the beat, melody, and harmony serve as carriers for the semantic content. This is why it is easier to recall the words in a song than in a conversation. Furthermore, music also provides a helpful mnemonic for verbal learning throughout life and most notably during early development and in educational settings. Correspondingly, instructional strategies that were once successfully utilized in classrooms may not be as effective for the 21<sup>st</sup> century learners as they prepare to become leaders of the future [23]. Hence, teachers shall be innovative in their schooling approach in order to ultimately convey to their pupils their lessons. In reiteration, as cited by [3], according to [4], teachers should be creative in their thinking and in their approach.

### 3) Comparison between Groups (*i.e.* involving traditional method and science pop-tunes combo)

**Table 3** shows the treatment result. Post-test data of the two teaching methods after the lessons were taught showed a highly significant difference ( $t = 4.457$ ). The experimental group that used the science pop-tunes combo as an intervention had a highly significant and better retention of facts and concepts and was found to have improved in gain scores compared to the control group. The observation suggests that strategizing science pedagogy using science pop-tunes combo produces the learning outcome that is significantly enhanced. This finding also agreed with [8], stating that songs are enjoyable in the classroom because these lower stresses, boredom levels, and students tend to understand and retain key information better.

Based on the result, since the computed  $t$ -value (4.457) is greater than the tabulated value which is 1.721, the null hypothesis is therefore, rejected. Hence, there is a significant difference occurring on the gain scores based on the science pedagogy using traditional method and science pop tunes. It infers that the use of science pop-tunes combo produces better learning rather than using traditional method of instruction.

## 4. Conclusions and Recommendations

In the light of the findings, the following conclusions were drawn:

- 1) The experimental and control groups performed at the same level before the experiment.
- 2) The experimental group performed better in the post-test than the control group and

**Table 3.** Test of equality of means of the post-test results between traditional method and science pop-tunes combo.

Group	Mean	$t_c$	p-value	Decision	Interpretation
Control	25.14				
Experimental	32.41	4.457**	0.000	Reject Ho	Highly significant

\*\*Highly significant at 0.01 alpha level, Ho-null hypothesis not significant at 0.05 alpha level.

3) Hence the intervention using science pop-songs combo was effective in improving the students' performance in science. There was a highly significant difference in the post-tests as well as in the mean scores of the experimental group registering higher mean compared to the control (traditional method) group.

Based on the conclusion of the study, the following are recommended:

1) It is experimentally observed that utilizing the science pop-tunes combo as an intervention is more effective than traditional method of teaching, so adoption of the said strategy by science teachers is being recommended.

2) Utilizing this intervention to other grade levels should also be made to address the learning gap.

3) A similar study may be conducted covering a bigger number of participants in another venue and involving other teaching-learning areas and grade levels.

4) The students themselves will be the one to compose their own songs to check their understanding of the lessons being discussed.

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### Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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