

The Effectiveness of Using Song Therapy In Increasing Year 5 Primary Pupils' Engagement In Science Classroom

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Abstract

The purpose of this study is to investigate the effectiveness of song therapy in increasing students engagement in Science classroom. The researcher used questionnaire on students engagement items to analyze students level of engagement after using song therapy in teaching science. The questionnaire has three sub categories, (1) cognitive engagement, (2) affective engagement and (3) behavioral engagement. The participants are total of 82 students from both controlled group (38.1% males and 61.9% females) and experimental group (45.0% males and 55.0% females). The data were analyzed using both descriptive (mean, frequency and percentage) and inference (Independent sample t-test, paired sample t-test and Kruskal-Wallis). The findings showed that students engagement after using song therapy is higher than before using it between the pretest and posttest for experimental group. Besides that, students' engagement has increased after using song therapy to experimental group students compared to without using it to controlled group. Moreover, the mean between gender female and male is not much difference and not significant in comparing gender on the effectiveness of using song therapy for experimental group. In addition, the findings showed that the students level of engagement in Science classroom after the posttest is not effected by their level of achievement in Science test.

Keywords: The Effectiveness of Using Song Therapy In Increasing Year 5 Primary Pupils' Engagement In Science Classroom

Introduction

Background of Study

Malaysia is a developing nation that is moving towards a globalized world to achieve vision 2020. Therefore, education plays a key role to place the country at a most high level. With this realization, the Malaysian government places importance in education as first step to achieve vision 2020. Hence, it is clearly shown that education is put at the top of the needs of a nation to be able to make a human being who is competitive, capable and always finds and alternative solution to get rid of any problems which affects the reputation of our country.

Educators may use various teaching strategies to achieve the learning objective of the lesson. One of the methods that educators can use is songs. Music can be integrated with teaching in all subjects and of course it brings significant impact in teaching and learning also. Teaching and learning Science is a fun experience where it involves mostly knowing about nature and how things happen around us do. Besides that, according Jensen (2000), music and related content of lyrics brings the information and make emotional impact. Songs for learning science can be designed for all grade levels and include information about, facts and concepts included in the science curriculum.

According to Einser (2003), using song embedded with music help students to remember something better. This is because, the emotions that a student feels more connected to his learning mood. This is supported by Sousa (2006), who says emotions can affect attention and learning and strengths students' memory to remember the certain content. (pg 44). Hence, it clearly shows that music embedded with song is more relevant to teach science topic to help students actively take part in science classroom as well as they are able to understand the content of a topic better.

'Kamus dewan Edisi Ketiga (2000) defines song as lyrics composed with music or a tune and sung with the voice. When a song is related to Science song, the lyrics associated with the Science concepts that it would like to teach. Therapy is also

meant as a method. According to the book 'Siri Pendidikan Perguruan: Pedagogi Untuk Kursus Diploma semester 3', Mok (2002) defines method as an activity which is carried out systematically to achieve a learning objective. In this research, pupils will sing the song the process of water cycle with lyrics related to the topic and embedded with the melody to understand the topic better.

Furthermore, the words in the songs are easily remembered because students are bringing in emotions while singing. This is what stated by (Caine & Caine, 2001, p.47) that any message which is delivered through emotions will improve learning. Therefore, songs used in teaching science content also will be very useful to help to students to remember the content for longer time. According to (Jensen, 2008, p.75), songs with music in science –content songs can be used to teach science content information and because of the emotional response elicited by music, students are able to store the information for longer time.

Engagement of pupils in a learning classroom is referred to pupils' participation in the classroom. According to (Metallidou & Viachou, 2007), cognitive engagement of pupils in a classroom is defined as how pupils feel about themselves and their work. Besides that, Skinner and Belmont (1993) elaborates affective engagement of pupils as feel of interest, joy, anxiety, and anger during carried on activities. Therefore, the engagement of pupils in science classroom in this research is referred to how actively they are participating or showing interest in learning Science by using song.

In a study by Calvert and Tart 2 (1993) a melody selected from the 1970's Schoolhouse Rock television series was used as a teaching strategy to determine if text was remembered better when played via song or learned verbally and the researcher found that the songs were powerful mnemonic tool to recall what has been taught and were useful to apply the knowledge (Calvert and Tart, 1993). Besides that, according to the research done by Wallace (1994) in four different treatment to see the effectiveness in using song to remember a text compared to via listening, he concluded that "melody of a song able to make a text more memorable compared with listening the text out of the context of the melody" (p.1481).

It is assumed that most children love music and love to sing. Therefore, children will actively take part in the science classroom if the content is taught through singing songs. Besides that, children will find a straightforward way to remember the science content for longer time. According to Chris Brewer (1995), he states that integrating music in a lesson can be used to remember an information. The sound in the song increases interest of one and activates their information mentally, physically and emotionally. He says that content which is put to rhythm and rhyme will help to recall at any time. Besides that, music with the song able to focus and gain one's attention. Music can create a positive learning environment and brings effect on students' attitudes and motivation to learn. This is because, the rhythms of the musical sound can help one focusing their attention on what we learn.

Problem Statement.

In a classroom setting, there are number of group pupils such as active learners and passive learners. All the pupils in the classroom may not able to catch up with flow of teaching style by the educator. Learners are come from different learning and processing information strategies. Not all students are capable with only one teaching and learning strategies. Therefore, the passive learners usually show lack of interest and not really engage in classroom activities as the lesson is boring to them. Pupils usually like to have activities like moving around, kinesthetic which keep them busy doing something to not make the lesson boring especially science lesson.

Therefore, the purpose of this study was to know the experiences of students and teachers when song integrated with music was used as a strategy in the science classroom to increase pupils' engagement in science activities.

The main purpose or objective of the research is to examine whether the effectiveness of song method help in understanding the process of water cycle among Year 5 Science pupils by analyzing their responses from given questionnaire items. Specifically, the study is conducted to fulfill the following objectives;

1. To identify the level of engagement of students before and after using song therapy in Science classroom.
2. To identify if there is any difference in the level of engagement of pupils between two groups before using song therapy.

3. To identify the level of engagement of pupils affected by the teaching song therapy in Science classroom based on the gender.
4. To identify the level of engagement of pupils affected by the teaching song therapy in Science classroom based on their level of achievement.

Research Design

To test the use of song therapy in teaching Year 5 pupils 'water Cycle' topic, quasi-experimental research design is implemented. The quasi experimental nonequivalent control group design is shown below in Figure 1 (Gay, Mills, Airasian, 2009). Quasi experiments are experimental experiments in which is assigned by the researcher, but not randomly participants to groups because the researcher cannot simply create groups for the experiment (Creswell, 2008). This quasi-experiment of causal comparison is most suitable in investigating effectiveness of an intervention with the intact groups and it can be used whenever the true experimental design is not done easily (Creswell, 2008; Wallen, 2006). Therefore, the total number of pupils in each group are different.

Group	Pretest	Treatment	Post test
E	O	X	O
C	O	-	O

Figure 1 Quasi Experimental None equivalent Control Group Design

E – Experimental Group X – Song Therapy Strategy Teaching (STST)

C- Control group - Conventional Strategy Teaching (CST)

O – Yes N - No

The experimental group, E would undergo STST meanwhile the control group, C would undergo CST under the same topic for two weeks. The questionnaire will be distributed to both of the groups before the treatment starts. The treatment will be on only for two weeks to avoid the interruption of the teaching period. In this study, two different classes of Year 5 from the same school will be chosen. Ary, Jacobs, and Sorensen (2010), have said that the time table in the classroom cannot be disturbed and rearranged to conduct the research in a school. Therefore, one uses groups that already exist as said by (Creswell, 2008). Hence, the implementation of song therapy in teaching only focuses for two weeks treatments.

Song Therapy

Song Therapy teaching strategy is used for experimental group. Pupils will be given a song on the rain formation which is downloaded from YouTube. Pupils will sing along with the video and engage actively while singing. The lyrics and the visual shown in the video help pupils to remember the sequence of rain formation well.

Sampling

In this study, the target group is Year5 primary school pupils. The pupils are from one of the Tamil primary schools in Perak. There are two Year 5 classes. Both classes are categorized as normal class which comprises fast, intermediate and weak students. Two classrooms stated above as two intact groups which is an already exist group like as a class or group is set up independently of the planned experiment (Ary et al.2010). Random sampling is done where coin toss is carried out to determine which is the experimental and control groups in this research. The Song Therapy (experimental group) comprises 40 students. They are 19 males and 21 females. The Conventional Strategy Teaching (control group) comprises of 42 students where there are 15 males and 27 females. Gall, Gall, and Borg (2007) have written that there should be at least 15 participants in each existing group to be compared in experimental research. Therefore, the sample sizes for both groups in this research are appropriate in conducting the research. 28 students with 66.7% from controlled group and 11 students with 27.5% from experimental group obtained Grade A in Science test. Furthermore, the total of 14 students with 33.3% from controlled group and 16students with 40.0% from experimental group obtained Grade B in Science test. There are none obtained Grade C in controlled group but 9 students with 22.5% obtained Grade C in Science test. Grade D also obtained by none in controlled group but 4 students with 10% obtained Grade C in Science test. In overall, Grade A is obtained by most number of the students from the sample in the Science test.

An independent-samples t-test was conducted to compare the students' engagement according to their group in the pretest. Such results reveal that the two groups have the same level of engagement before the experiment which means that any future progress in their engagement level will be according to the teaching method.

Instrumentation

In this study, a questionnaire with 26 items are adapted and modified based on several engagement questions from the journal of students' engagement in Mathematics. The research is conducted by Qi-Ping Kong (2003), on Students engagement in Mathematics, to investigate or make query on students' engagement in the learning of Mathematics contents among CHC regions. The samples of the research were 4 classes from Grade 5 which are different schools from the city of Shanghai. The researcher has identified 3 dimensions of engagement based on the interview he has done to his samples. He has constructed the items based on the phrases and wordings found in the interview transcripts. The researcher also has considered well established items, such as the Affective Engagement Questionnaire (Miserandino, 1996) and Student Engagement Questionnaire (Marks, 2000). Furthermore, he has referred to Learning Process Questionnaire (Biggs, 1987) to design items on cognitive engagement. The research he has done has shown internal consistency reliability high with the median of 0.86. Likert scale is used in this questionnaire, with options ranged from Agree, Disagree, Not sure.

Reliability: The Cronbach's Alpha found is 0.84 is reliable according to Ary et al. (2010) where a coefficient of 0.80 for a test creativity would be judged as excellent.

Data Analysis

Research Q1: Effectiveness of song therapy between pretest and posttest for experimental group.

Considering the difference between pretest and posttest for experimental group, the researcher used paired sample t-test samples. The results included in table 1.

Table 1 Results of Paired Sample T-test for experimental group between pretest and posttest.

	Test	Mean	N	Std. Deviation	Std. Error Mean	t	df	sig.
Cognitive	pre	1.25	40	.28	.04429			
	post	1.63	40	.30	.04811	-5.760	39	0.000
Pair 2	Affective	1.24	40	.36	.05840			
	Affective2	1.50	40	.24	.03897	-3.520	39	0.001
Pair 3	Behavioral	1.68	40	.33	.05277			
	Behavioural2	2.05	40	.95	.15170	-2.210	39	0.033
Pair 4	Engagement	1.28	40	.28	.04518	-5.530	39	0.000
	Engagement2	1.72	40	.34	0.5481			

A paired-samples t-test was conducted to compare the pretest and posttest between experimental group. The results in table (1) shows that there are differences in students' engagement in the pretest (M = 1.2875, SD =.4518) and posttest ((M = 1.729, SD =.5481, t(39) =-5.53, p = 0.05). It is clear from this result that students engagement after using song therapy is higher than before using it. Revealing the effectiveness of song therapy as an effective tool to increase student's

engagement. Besides that, there are differences in students cognitive engagement in the pretest ($M = 1.2500, SD = .28011$) and posttest ($(M = 1.6350, SD = .30429, t(39) = -5.76, p = 0.05$). It is clear from this result that students' cognitive engagement after using song therapy is higher than before using it. Moreover, there are differences in students affective engagement in the pretest ($M = 1.24, SD = .36$) and posttest ($(M = 1.50, SD = .24, t(39) = -3.520, p = 0.05$). It is clear from this result that students' affective engagement after using song therapy is higher than before using it. Additionally, there are differences in students behavioral engagement in the pretest ($M = 1.68, SD = .36$) and posttest ($(M = 2.0500, SD = .95943, t(39) = -2.210, p = 0.05$). It is clear from this result that students' behavioral engagement after using song therapy is higher than before using it. In general students' level of engagement has increased after using song therapy in Science classroom.

Research Q2 : Effectiveness of song therapy between posttest for both experimental and controlled group.

Table 2 shows posttest between both groups.

RESPONDAN	Group	N	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tail)
Cognitive	Control	42	1.29	.37142	.05	-4.580	80	0.000
	Experimental	40	1.63	.30429	.04			
Affective	Control	42	1.44	.26669	.04	-0.993	80	0.324
	Experimental	40	1.50	.24648	.03			
Behavioural	Control	42	1.48	.62944	.09	-3.150	80	0.002
	Experimental	40	2.05	.95943	.15			
Engagement	Control	42	1.40	.32131	.04	-4.350	80	0.000
	Experimental	40	1.72	.34665	.05			

An independent-samples t-test was conducted to compare the students' engagement according to their group in the posttest. The results in table (2) shows that there are differences in students' engagement in the posttest; controlled ($M = 1.4086, SD = .32$) or experimental ($M = 1.72, SD = 0.34$), $t(80) = -4.350, p = 0.000$. It is clear from this result that students' engagement has increased after using song therapy compared to without using it. Moreover, there are differences in students' cognitive engagement in the posttest; controlled ($M = 1.2905, SD = .37142$) or experimental ($M = 1.63, SD = 0.30$), $t(80) = -4.350, p = 0.000$. It is clear from this result that students' cognitive engagement has increased after using song therapy compared to without using it. Moreover, there are differences in students' affective engagement in the posttest; controlled ($M = 1.44, SD = 0.26$) or experimental ($M = 1.50, SD = 0.24$), $t(80) = -0.993, p = 0.324$. It is clear from this result that students' cognitive engagement has increased after using song therapy compared to without using it. Additionally, there are differences in students' behavioral engagement in the posttest; controlled ($M = 1.48, SD = 0.62$) or experimental ($M = 2.05, SD = 0.95$), $t(80) = -3.150, p = 0.002$. It is clear from this result that students' behavioral engagement has increased after using song therapy compared to without using it. In general, experimental group students' engagement has increased compared to control group students after using song therapy instead of without using it.

Research Q3 : Effectiveness of song therapy in posttest for experimental group Based on Gender.

Table 3 Results of independent Sample t-test between posttest for experimental group based on the gender.

GENDER	N	Mean	Std.	Std. Error	t	df	sig.
Cognitiv e2	MALE	18	1.7556	0.25946	2.401	38	0.021
	FEMALE	22	1.5364	0.3079			
Affectiv e2	MALE	18	1.5394	0.18801	0.825	38	0.414
	FEMALE	22	1.4745	0.28675			
Behav ioural2	MALE	18	1.9444	0.9376	-0.625	38	0.536
	FEMALE	22	2.1364	0.99021			
Engagemen t2	MALE	18	1.7461	0.38502	0.267	38	0.791
	FEMALE	22	1.7164	0.32054			

An independent-samples t-test was conducted to compare the students' engagement according to posttest for the experimental group based on the gender. The results in table (3) show that there no differences in students' engagement in the posttest; male (M =1.7461, SD =0.38502) and female (M =, 1.7164 SD =0.32054.), $t(38) =,0.267$ $p = 0.791$ = based on the gender . It clearly shows that, the mean between gender female and male is not much difference and not significant in comparing gender on the effectiveness of using song therapy. In addition, students cognitive engagement in the posttest for male (M =1.7556, SD =.25946.) and female (M =, 1.5364 SD =0.30790.), $t(38) =2.401$, $p =0.021$. Both the mean has difference and the results shows significant value. It might be because male students mostly responded 'agree' to the cognitive engagement based items compared to female students. Besides that, no differences in students affective engagement in the posttest male (M =1.5394, SD =.18801) and female (M =1.4745, SD =0.28675), $t(38) =0.825$, $p = 0.414$. It clearly shows that, the mean between gender female and male is not much difference and not significant in comparing gender on the effectiveness of using song therapy. Furthermore, no differences also in students' behavioral engagement in the posttest male (M =1.9444, SD =. .93760) and female (M =2.1364,SD =99021.), $t(38) =-0.625$, $p = 0.536$. The reading shows no significant value in comparing both male and female students' behavioral engagement after using song therapy. In conclusion, there is no difference and no significant value in student's engagement if compare between male and female students' in the experimental group after using song therapy.

Research Q4 : Effectiveness of song therapy in posttest for experimental group Based on Level of Achievement.

Table 4 Results of Kruskal –Wallis test between posttest for experimental group based on their level of achievement

Test Statistics^{a,b}

	Cognitive2	Affective2	Behavioural2	Engagement2
Chi-Square	1.030	2.191	2.581	1.552
df	2	2	2	2
Asymp. Sig.	.598	.334	.275	.460

a. Kruskal Wallis Test

b. Grouping Variable: GRADE

A Kruskal-Wallis test revealed that there was no any significant effect of level of achievement of students on their engagement in Science classroom. ($H(2) = 7.27$, $p < .05$). Eventhough, students from the experimental group has scored Grade A, B C and D in their previous Science test, it did not affect their engagement in Science classroom. For instance, students' cognitive engagement has significant value = 0.598, students affective engagement has value, $p = 0.334$, behavioral engagement has value, $p = 0.275$ and the overall engagement has value , $p = 0.460$ which are greater than >0.05 . It clearly shows that, students level of engagement in Science classroom after the posttest is not affected by their level of achievement in Science test.

Discussion

The results show that there are differences in students' engagement in the posttest; it is clear from this result that students engagement has increased after using song therapy compared to without using it. This indicated that the song therapy has made difference in students' engagement level to perform better in their learning style in Science classroom. This is supported by (Jensen, 2008) where he says that a content of learning comes along with music and songs is effective in activating multiple neural networks. Songs comes along with music helps the neurons in a human brain in remembering a content for a longer time memory.

The results show that there are differences in students' engagement in the pretest and posttest. It is clear from this result that students' engagement after using song therapy is higher than before using it. Revealing the effectiveness of song therapy as an effective tool to increase students' engagement.

This is supported by the researcher Campbell (1990) on his title 'Multiple Intelligences In The Classroom' stating, songs help them to remember facts well as well as able to increase their self-confidence. This is proved when the respondents gave positive perception towards using song learning where they said by singing they are not only enjoyed but also feel confident when remembering what they have learnt well.

Based on Gender

The results show that there are no differences in students' engagement in the posttest between the genders. It clearly shows that, the mean between gender female and male is not much difference and not significant in comparing gender on the effectiveness of using song therapy. The results indicate that the students who are male or female does not matter on giving effect to learn Science through song.

This is supported by research has done by Zainure (2003), on using music with song in teaching and learning Biology process.

Level of Achievement.

The results show that the engagement of students' level only increased after the active participation in the classroom. This is supported by Brewer (2007), in his research stated that, embedding songs with music is really effective in teaching and learning process. Learning through music with song will help students to remember what they have gone through in the classroom as well as make students actively participate in the classroom.

Nevertheless, there are some suggestions can be made if similar to this research is to be carried out in future.

- a. Increase the number of samples to see more effective result on the effectiveness of song therapy in teaching and learning process.
- b. Besides that, the researcher can use more than one topic from the subject to see more engagement level of students in the classroom with using song as method of teaching.
- c. The researcher might use different songs with music for the focused content rather than using only one.

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