

Implementing a “choose your own adventure” method in teaching basic concepts of sound to primary-school teacher candidate students

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Abstract. The grasps of basic physics of sound of primary-school teacher candidates were examined. Ninety students of primary-school teacher candidate program participated in this study. The experimental group was introduced to the basic concept of sound teaching with “Choose Your Own Adventure” method using a daily-life story related to sound; and the control group received the same material with traditional lecture method. The result shows that the students taught with “Choose Your Own Adventure” method got better understanding on basic concepts of sound than students taught with traditional lecture method. The finding suggests that “Choose Your Own Adventure” method may be able to enhance students’ mastery on science especially on basic concepts of sound.

1. Introduction

It is common to have traditional teaching approach in education, especially at university level [1]. However, traditional teaching approach may lead to the boredom of learning experienced by the students. Students in classes with traditional teaching were 1.5 times more likely to fail than students in active learning class [2]. In addition, to some extent, science teaching that has always been focused on inductive reasoning, experimenting and analytical thinking is usually lack creativity which may result some loss of students’ interest in learning science since the students may feel that science is difficult [3]. Furthermore, some science teachers face challenges that there are differences between what the teachers “do” in class and what they are actually expected to do in terms of teaching [4]. It means that for some way in teaching teachers should make efforts to be more adapted to the way they are expected in class. Besides, the number of students interested in studying science has decreased all over the world [5]. Therefore, it is crucial to bring forth new way of science teaching to enhance the students’ interest in learning science.

Using stories in science teaching may be used to improve students’ enthusiasm in learning science. Storytelling can be benefited as an effective science teaching approach [6]. A study also shows that a project-based digital storytelling approach could enhance the students’ science learning motivation and achievement [7]. Nonetheless, stories and storytelling have not been widely used in science classrooms [3]. An implementation of “Choose Your Own Adventure” in storytelling to enhance students’ participation in the teaching-learning process was introduced in this study. “Choose Your Own Adventure” (CYOA) is a way of storytelling adapted from storybook concept by Edward Packard [8]. The original storybooks allow the readers to choose different kinds of plot and ending. The stories would depend on the choices of the readers themselves, so that the readers are really



involved as actors of the stories. This kind of storytelling is assumed to be a good approach in teaching, including in delivery basic concepts of science to the students.

This study is an initial study that investigated the effectiveness of storytelling with “Choose Your Own Adventure” method in science teaching, especially basic concepts of sound.

2. Methodology

This study was designed to compare “Choose Your Own Adventure” (CYOA) and traditional approaches of teaching science especially basic concepts of sound. An experiment was done at Universitas Pendidikan Indonesia, Sumedang Campus with 90 elementary school teacher candidate students as samples, whereas all of elementary school teacher candidate students in Universitas Pendidikan Indonesia Sumedang Campus were the population.

This study used quasi-experimental design with pretest-posttest control groups which involved 44 students in the control group and 46 students in the experimental group. Samples in the experimental group were treated with CYOA method while students in control group were taught with traditional teaching approach.

“Choose Your Own Adventure” method was given as a treatment in experimental group by giving a daily-life storyline in the lecturing presentation slides with basic concepts of sounds embedded. At some points of the presentation, students (as a class) in the experimental groups were asked to choose their own story plot. Pretest as well as posttest is a set of problems containing 14 questions about basic concepts of sound.

3. Results and discussions

The topic of basic concepts of sound was selected as a topic of physics learning to be investigated with CYOA since the storytelling process itself involves the use of producing and listening to the sound. It is assumed that for this initial study, it would be suitable to talk about sound because it is directly related to the way of CYOA delivered.

The descriptive statistics of the research is shown in table 1. It can be seen that the mean of posttest results in both groups were higher than the pretest results.

Table 1. Descriptive statistics of pretest-posttest results for control and experimental groups

Test type	N	Minimum	Maximum	Mean	Std. Deviation
Pretest – control group	44	6	13	10.1136	1.75494
Pretest – experimental group	46	5	14	10.5435	2.09451
Posttest – control group	44	7	14	11.2273	1.41197
Posttest – experimental group	46	9	14	12.0652	.99782

From the statistical test for all of the test results, the outcome shows that there is no significant difference on the mean of pretest results for both groups. Therefore, final result for the difference of both groups can be seen from the posttests. With independent-samples Mann-Whitney U Test for $\alpha=0.05$, it can be inferred that there were significant difference between posttest in experimental group and control group (Sig. .002), and from table 1 it can be identified that the posttest result for experimental group is higher than the control group. Hence, this means that the understanding of basic concepts of sound of students taught with CYOA method is better than students taught with traditional method.

It can be seen from table 1 that after the teaching-learning process, the increase of minimum score of students from experimental group (4 points) is higher than from control group (1 point). This indicates that some students with the lowest scores in experimental group who were taught with CYOA reached better understanding of basic concepts of sound than students taught with traditional method.

The author used daily-life topic that was assumed to be suited to young-adult students (aged 17-22). In this study, the story was about relationship, and it was clearly seen that the students showed enthusiasm towards the story plot. One of the keys to get students' attention to the teaching-learning process is to attract them from the beginning. When the lecturer started the class by telling the students that the lesson at that time would be about listening to a story, the students became curious and concentrated to the rest of the lesson. This suits the result of previous research which said that engaging students in their learning and motivating them with stories brings them out of the shadows of instruction [9]. Students may feel involved to the story and find that basic concepts of sound embedded in the story is not merely a topic to learn but also something found in daily life, which can be seen from the story plot. Moreover, the way students choose their own story plot as a characteristic of CYOA engaged the students' interest. This agrees the study result that said that the familiarity of the story form helps students retain the information they learn due to the strong emotional appeal [10]. Involving students' emotion in a teaching-learning process by delivering material with daily-life story plot and allowing them to choose their own story plot captivated the students' attention.

Nonetheless, this research has several limitations. As an initial study and to avoid the implementation threat on internal validity, the study was conducted in one meeting of basic concepts of sounds topic, as it was programmed previously (one topic is being taught in one-meeting only). It is assumed that if the students can be immersed in a more intense teaching-learning environment of CYOA with more number of meetings, the result might be more adequate. Moreover, the lack of random sampling in this quasi-experimental research might lead to a threat of external validity. In addition, it can be seen from table 1 that the maximum score of pretest for students from experimental group was 13 (out of 14), and for students from control group was 14 (out of 14). This may indicate that some students have mastered the basic concepts of sounds before the teaching-learning process was conducted. Therefore, although statistically it can be presumed that in general after the teaching-learning process there were result progress for both groups, this was not necessarily applied to all students.

Despite of these limitations, this study adds an important role in science teaching using storytelling, especially in basic concepts of sound. The use of CYOA might be a breakthrough to the way of making science teaching in class more interesting because it does not only involve students as listeners but also as "decision-makers" of the story plot, so that the class may be held more lively than the traditional class.

4. Conclusions

Using CYOA method as a part of teaching science through storytelling enhanced students' understanding on basic concepts of sound. The result shows that implementing CYOA method is better than traditional method in teaching basic concepts of sound. This initial study of using CYOA while giving lecture to primary-school teacher candidate students may lead to follow-up research about the effectiveness of CYOA in teaching science to primary-school students and to other studies related to teaching science involving storytelling.

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