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KAMISHIBAI (JAPANESE PAPER THEATER) IN PBL AS A SUPPORT OF ENVIRONMENTAL EDUCATION LEARNING

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Abstract

Choosing the correct learning methods is the key for success in teaching-learning process. One of the methods is by using picture cards and PBL (Problem-Based Learning) method, where students are encouraged to identify a problem, find the causes of the problem and provide solutions to the problem. A research was conducted at 5 (five) elementary schools in Malang, Indonesia, with the total respondents of 200 students. The teachers explained to the students on issues related to waste and rivers, using a particular text book. In groups, students were given picture cards and they had to arrange the cards to create a story. The students had to write down the story afterwards. The obtained data were then processed by text mining and the result classifies students into two different groups, ie. Group A which were able to create a story in details, using many words related to environment, and Group B which were not able to create a story in details. An analysis was then performed on the group which were not able to create a detailed story.

Keywords: *Problem-Based Learning, Environmental Education, Solid Waste Education, Environmental behavior.*

INTRODUCTION

Environmental Education is a significant part of the education for our next generation, in order to inherit environmental values to our children. Providing our children with Environmental Education will help them become environmental citizens who will be the leaders of tomorrow. Nurturing a respect for nature and all living things is an imperative that parents can convey to their children. Parents can do this by supporting and encouraging attitudes at home and at school that emphasize the importance of Environmental Education. Environmental Education includes both formal and informal education and training that increase human capacity and capability to participate in environmental management and in solving environmental crisis and challenges1) (Elagba Mohamed, 2006). Environmental Education has been growing rapidly in many countries during this new millennium2) (Hart 2007). However, many authors still believe that many schools fail to prepare their students in absorbing knowledge of Environmental Education 3)(Paul Mupa,2015). Problem-Based Learning (PBL) is an approach to developing a curriculum that involves students facing practical problems with a purpose to give them stimulus to learn4). PBL method using *kamishibai* (Japanese Paper Theater) as a media is argued to be effective methods for Environmental Education (EE). PBL method with *kamishibai* media encourages students to identify a problem, find the causes of the problem and provide solutions to the problem based on their own learning experience in EE, in accordance with students' individual context.

By applying PBL method with *kamishibai* media, students are able to create a story in a sequence, ie. introduction, the problem, theory, problem solving and analysis. Using pictures as a reference and based on their learning experience in EE with subjects of waste, water, river and forest, students are encouraged to discuss about the environmental issue in their groups. This approach is in accordance with the curriculum published by the Ministry of Environment and Forestry, which is applied at elementary schools in Malang, Indonesia.

This research discusses the application of PBL method with *kamishibai* media at elementary schools and shows that this media enables students to use their creative thinking skills in solving environmental problems around them. This research also argues that PBL method works effectively for both students and teachers in the teaching-learning process of EE.

Fig. 1 Children hearing about Kamishibai story (http://kamishibai.net

In our opinion, this approach can be argued to have a contribution in students' improving thinking competence. Through PBL method with *kamishibai* media, students are encouraged to observe, to ask questions, to think logically, to communicate and to present knowledge they obtain from the learning materials. Although it is not part of this research, we also found the potential of *kamishibai* media in improving students' verbal ability. Moreover, through this approach students are expected to have competence, attitude, skills and knowledge in identifying environmental issues. In general, we also notice the potential of PBL method with *kamishibai* media in encouraging students to be more creative, innovative, and productive, so that they have a capacity to encounter and even give solutions to various environmental issues.

Kamishibai has been a very popular and effective media applied in learning activities both in formal and informal educational institutions, especially in Kitakyushu, the best environmental-friendly city in Japan. Kitakyushu is very concerned about environmental issues. PBL method with *kamishibai* media has been applied for EE in the community and educational institutions, and also for conveying messages on EE.

METHOD

The methodology applied on this research is described as follow. As the first step, teachers conveyed EE lesson about waste, river and water, using the EE text book for 4th and 5th grade. The lesson was presented in 3 sessions. On the following session, students were put in groups of five and each group was given a set of *kamishibai* cards consisting of 9 different picture cards. The teachers gave instructions on what the groups should do. First, they have to observe all pictures on the cards. Afterwards, they have to arrange the cards based on the groups' discussion. And finally, they have to create a story based on the arranged *kamishibai* cards

The groups' stories were then analyzed using text mining. The analysis considers the usage percentage of words related to vocabularies contained in the EE text book. This is also a way to measure students' comprehension on the EE lesson given previously; based on the sentences or words they use in their stories. The stories were then analyzed using text mining.

Each card given to the students has a different story on it, as below:

Card 1: Throwing garbage into a river
Card 2: Dirty river
Card 3: Cleaning a river
Card 4: Collecting garbage
Card 5: Waste bank
Card 6: Organic waste
Card 7: Processing organic waste
Card 8: Swimming in a clean river
Card 9: Clean river, source of life

By using *kamishibai* as a media, it is expected that students are able to perform discussions in their groups, as a way to encourage collective learning among the students. In addition, through a discussion, students can develop their ability to listen to opinions and make synthesis of different opinions. Following the discussion, a presentation of the group discussion result is performed and it is considered as equal to their/giving students experience in dissemination of knowledge.

FINDINGS AND DISCUSSION

The analysis result on the vocabularies using text mining were classified into two groups, Group A and Group B. Group A consists of students who used many words related to environment in their stories and Group B consists of students who used few words related to environment in their stories. An analysis was then conducted on Group B, where students used short sentences and few words related to environment.

Text mining on all stories

Words were collected from the stories created by students and analyzed using text mining. . From 50 stories, 10 mostly-used words are collected, ie. garbage, clean, organic, environment, to throw, to clean, community, compost, flood and polluted. The number of words used by students indicates the level of students' vocabulary and knowledge on environmental issues. Showed in Figure 1.

Fig. 1 Students' vocabulary and knowledge on environmental issues

Text mining allows us to see how students translate pictures into words. The result of word phrasing into a story describes students' comprehension on the EE lesson they received earlier, as well as their attitude and habits.

The picture on card no.1 illustrates a person who throw garbage into a river. This card is the most chosen card for the first position in the card arrangement, considered as the cause of environmental issues. This indicates that students understand that throwing garbage into a river causes pollution. Table 1 below shows the cards and their positions in the arrangement made by students while creating their stories. Of all groups, 29 groups put Card no. 1 on the first position and 14 groups put Card no. 2 on the first position, as shown on Table 1 below.

Table 1

No card	urutan Kartu yang muncul						
	1	2	3	4	5	6	7
1	**29**	6	1	2	0	0	0
2	14	**22**	7	3	0	1	0
3	2	12	**19**	10	2	1	0
4	0	2	9	10	4	2	0
5	2	2	7	**16**	**16**	5	2
6	0	0	0	1	3	1	0
7	0	0	0	2	1	2	1
8	1	1	3	1	7	**14**	**5**
9	2	5	4	3	10	7	1
Total	50	50	50	48	43	33	9

Text mining on each picture

The next step is performing analysis on each picture. Picture no.1 is the most chosen one, by 58%, for the first position as the cause of the problem. Ten (10) related words sorted as the result of text mining are garbage, to throw, carelessly, community, environment, river, polluted, to cause, dirty and organic. Picture no.2, illustrating a dirty river, is chosen as the second position by 44% and generates 10 words, ie. river, garbage, to throw, to become dirty, waste, environment, carelessly, community, flood and polluted. This indicates that students understand that a river full of garbage can cause flood, besides it is dirty and polluted. Picture no.3 illustrates two children picking up garbage from a small river. This picture is chosen as the third position by 38% and the most words generated from the picture are to clean, river, environment, to pick up garbage, clean, to collect, children and organic. Picture no.4 illustrates a girl collecting scattered garbage and the most generated words are garbage, children, to pick up, to collect, river, organic, plastic, environment and cans. From Picture no.5, students create a story on how to solve waste issues and one of the solutions is by becoming members of Waste Bank, in which they store non-organic waste, sort waste based on types, and recycle it. Picture no.6 is about organic waste, which can be processed into compost and accordingly the words generated are compost, organic, processed, fertilizer and recycle. Picture no.7 is about composting and the words generated are organic, waste, processed, to fertilize, to plant and recycle. Picture no.8 illustrates the condition after waste is recycled and composted. For this situation students used the words garbage, environment, clean, river, waste, community, swimming, happy, excited and enjoy. Picture no.9 is the most chosen one for the last position in the arrangement and the word appears the most is clean. Other words generated are to throw, garbage and community.

Card no.1 was chosen as the problem cause by 58% of the participants, while Card no.2 was chosen by 44%. Card no.3 was chosen by 38% for 3rd position, while Card no.5 was chosen for 4th and 5th positions by 33% and 37%. Card no.8 was chosen for 6th position by 42% and it was chosen as the end of the story by 55% of the participants.

Based on the result of text mining data processing, the participants were classified into two big groups. One group (Group A) is for those who created stories using many words related to environment, and the other group (Group B) is for those who used few words related to environment in their stories. Group A created story lines in accordance to what has been explained previously by the teachers in the EE lesson. They created stories consisting of 200-250 words using *kamishibai* as a media. This indicates that Group A comprehended the lesson and was able to create stories by identifying the problem, finding the cause of the problem, solving the problem and analyzing the problem.

Based on the stories created by the students, we can see that students who paid attention to what the teachers explained in the EE lesson, were able to create stories on environmental problem, analyze and provide the solution to the problem. Through *kamishibai* as a media, these students created stories in details, using many words related to environment. On the other hand, the students who created stories using few environment-related words and short sentences, probably did not pay attention to what was explained previously by the teachers during the EE lesson.

Students who pay good attention to teacher's explanation during the lesson and actively participate on the lesson are likely to have bright future13).

PBL method with *kamishibai* media has many advantages, not only it makes students more excited following EE lessons, but also it sharpens students' skills to become more sensitive in looking at environment-related problems. Arts and language usage are other aspects that can also be assessed by this method, but it will not be discussed on this journal. Those aspects will be

discussed on the next journal.

By using *kamishibai*, students improve their skills to transform the story into a drama that invites the audience to use their imagination, for example by using different intonations in telling the story. There are many advantages in using learning media in teaching EE.

Students of Group B tend to create short stories using few words and short sentences. During presentation in front of the class, they did not use many words related to environment. When the teachers asked whether they understood about the story line, some groups said that they did not understand the instructions, some said they did not understand on the story line that they have to make, some said they did not have any idea, and some even did not have any answers. There is a possibility that they did not pay attention to what the teachers explained during the EE lesson. However, it is also possible that these students misunderstood or had problems in understanding the sentences and vocabularies.

Students of Group B probably are not familiar with waste issues, including waste sorting, in their daily life, unlike students in Kitakyushu, Japan. In general, people in Kitakyushu are used to sort their waste prior to storing it into waste bins. Accordingly, students of Kitakyushu get an impact on applying the same habit as they see it every day at their house. Some efforts are certainly required in making students of Group B to have the same habit as students in Kitakyushu. Students of Group B is suggested to follow the EE lesson again in order to have a better understanding on waste, problems related to waste, the cause of the problems and the solution to the problems. Reassessment is required to get a picture on students' level of understanding, which part of the lesson that they do not understand, what causes students not be able to create stories. The teachers are advised to represent the lesson using the same text book, but with different teaching methods.

The teachers are expected to evaluate on whether or not students understand the lesson and also consider suitable teaching methods that will help students understand the lesson. As students have different levels of abilities in understanding the lessons, teachers should be able to apply various teaching methods that suit the condition. Teachers should also have abilities to encourage students to give opinions, considering their role in PBL method as facilitators who guide students' mindset.

The teachers are advised not only to represent the lesson, but also to encourage the students to think about and analyze environmental issues. As students have different level of cognitive skills, teachers are encouraged to find teaching methods suitable for the students. The previous teaching methods was probably too complicated for students in Group B. Therefore, the teachers should consider other teaching methods that will suit this type of students.

K*amishibai* as a media in learning process stimulates students to think and giving opinions, to create a story line and to find new words, hence improve students' vocabularies according to their age 14). The usage of words is determined by the place where students live. For example, students who live in a coast area often use words such as wave, sand, storm, water, tide, etc., while students who live in a city tend to use words such as smoke, pollution, traffic, etc14). B3

On EE subject for elementary, junior high and high schools which applies the curriculum published by the Ministry of Environment and Forestry, words such as garbage, waste, liquid waste, deforestation, water pollution, etc. are often used. For this reason, during the activity using *kamishibai* media, students used these words in their stories, as they learned the words from the lesson they got earlier. In addition, students searched from internet or other sources, in order to improve their vocabularies and broaden their imagination.

Environmental Education has been defined as a subject that encourages people, especially young generation, to build harmonious relationship between human and their environment. In

the implementation, a media is required in order to convey the message and to express the words, and *Kamishibai* is considered as a suitable media as an opportunity to take responsible actions15).

Conservation education concept is fundamentally different from traditional education in the form of subjects, such as science or social science which only aims to recognize the natural and social aspects. Conservation education is experiential education conducted in real nature, as the basis of EE. Conservation education system is formulated for people in all ages, from babies to the elderly, aiming to develop an aesthetic sense for nature, acquire knowledge about nature and communicate with nature through conservation activities. This natural experience will form the basis of human thoughts and actions. A recently popular approach for conservation education is solely through audio-visual media, instead of direct experience in real nature. It seems impossible to achieve what is expected through this kind of approach, considering the need to provide suitable education for children according to their personalities, passion, expression and opportunities to build their own relationship with beauty, novelty, attraction and joy of the nature. The real-nature approach is especially important for younger children to stimulate their sensitivity, foster their curiosity and develop their imagination. As a result, they are expected to obtain the ability to understand environmental issues and give solution to the issues. Furthermore, they are expected to have willingness to work independently for natural conservations.

CONCLUSION

This research concludes that PBL method with *Kamishibai* media for EE is an interesting learning experience for students. However, teachers' ability and participation hold a significant part of this method. Students need to have basis of thinking when they analyze a problem and teachers, as the facilitator, are expected to give the students the basic knowledge required for analyzing and solving the problem.

It is shown on this research that when teachers convey EE materials in using the right methods, students will be able to create stories using *kamishibai* media in a right way and in details. This experience is not only improving students' knowledge, but also their behavior and attitude. Therefore, teachers' teaching ability and knowledge are considered as significant support for the success of this method. It is agreed that learning using pictures are more attractive and easier to understand compared to memorizing the content of a book. Pictures easily attract students' attention and the content is easier to convey16). *Kamishibai* as learning tools can be developed using powerpoint and it helps students understand the lessons17). *Kamishibai* can also be used to study development and socialization methods through presentation of environmental stories18).

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