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THE APPLICATION OF BIOEDUTAINMENT "*FOOD FIGHT GAME*" STRATEGY ON ECOSYSTEM MATERIAL TOWARDS THE LEARNING RESULT OF THE 7TH GRADERS OF JUNIOR HIGH SCHOOL

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Abstract

This research aimed to analyzethe implementation of the "Food Fight Game" Bioedutainment strategy on student's learning achievement and student's learning activities in ecosystem teaching material. The type of the research was Non-equivalent Control Group in a Quasi Experimental Design. The population in this research was all students of VII class at SMP Negeri 18Semarang, and VII D class was treated as experimental class and VII C as control class. To collect data of students learning achievement a test was performed whereas student learning activities were collected by observation. Questionnaire was used to collect data of student response to the implementation of the "Food Fight Game" Bioedutainment strategy. The t-test has rejected H_0 atα= 5 %. T-test result showed that there was a significant difference between both groups. The average of student activities in the experimental class achieved 79% while the control group was only 72%. The conclusion of this research was that implementation of strategy Bioedutainment using Food Fight Game had a positive effect on student's learning achievement and student learning activities.

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INTRODUCTION

Learning biology means an effort to recognize real life process in the environment. Complex biology development needs to be followed by a learning approach which points to training, knowledge, willingness to always learn in life (Mulyani *et al.* 2008). Therefore, an interesting learning strategy is needed to be applied to draw students' interest in learning.

Interview with Natural Science teachers who teach the 7th graders in VII SMP N 18 and SMP YPE Semarang, showed that learning process had been conducted well. The delivery of the material used some methods like lecture and discussion method. Some media like PowerPoint, handout, and pictures were also used. However, teacher also stated that the interaction between teacher and students and between students during learning process was relatively low, so that students' learning activity was also low. The low students' learning activity was caused by the less varied learning methods used by the teacher. Students' participation during learning process was in the form of taking notes and listening to teacher's explanation. That condition created a one-way learning in which the students were less active in learning. As a result, students' motivation in teaching and learning process was low, and students' understanding towards the material was also low.

According to the syllabus for the 7th graders, ecosystem material especially on the basic competence of determining ecosystem and the interdependence between ecosystem's components, is expected to let the students observe their environment. However, because the school condition and situation were not supporting, not all materials could be learn by direct observation, for example in food chain and food web topic. Therefore, other strategies are needed to solve that problem and to improve students' interaction and activeness during learning process. The strategies should be fun so that students are motivated to learn and get higher result. One of the learning strategies is Bioedutainment "Food Fight Game".

Edutainment-based biology learning can be combined with other methods like discussion, outside class learning, experiment, educative games, role play, etc. (Christianti et.al.2012). ThroughBio-edutainment strategy, students are able to do some fun activities so that biology concepts are more understandable for the students.

Class games enable the students to describe and memorize the material, and connect the material they are learning. Besides, class games are proven to be able to improve students' motivation and involvement during learning process (Altamirano dan Jaurez 2013). One of the games that can be applied especially for ecosystem material is Food Fight Game.This game is formulated to help the students understanding the relation between ecosystems and identifying the components of ecosystem. The purpose of this research is to analyze the application of Bioedutainment strategy using Food Fight Game on ecosystem material towards the activity and learning result of the 7th grades of SMP N 18 Semarang.

METHOD

This research used Quasi Experimental Design with Nonequivalent Control Group Design. The independent variable of this research was Bioedutainment strategy using Food Fight Game. The dependent variable was students' activity and learning result.

The population of this research was all of the 7th graders in SMP Negeri 18 Semarang academic year 2015/2016. The sample of this research was chosen using purposive sampling technique. The samples were 64 students from VII C and VII D class in SMP Negeri 18 Semarang.

This research was designed in three meetings. The data were collected through test, observation, and questionnaire method. Test method was used to collect students' learning result after learning. Observation method was used to assess students' learning activity. Questionnaire method was used to collect students' responses on learning.

The data were analyzed using quantitative method, in the form of learning result score, learning activity, and students' responses towards the application of Bioedutainment Food Fight Game strategy. The influence of independent variable on the dependent variable was analyzed using chi square test, while the improvement of students' learning result was analyzed using N-Gain test.

RESULT AND DISCUSSION

The application ofBioedutain-ment Food Fight Game strategy in this research was combined with some methods like lecture, discussion, school garden observation, video observation, and simple experiment. It was done because not all sub-material in ecosystem material could be delivered using Food Fight Game. The purpose of Food Fight Game was to simulate food chain and food web which could not be observed directly by the students during the learning process. After that students were given evaluation test or post test. Post test result was used to measure students' understanding towards the learning material.

Table 1. The Recapitulation of Students' Activity in Experimental and Control Class

No	Scored Aspects	Experimental Class			Mean	Control Class			Mean
		P.I (%)	P.II (%)	P.III (%)		P.I (%)	P.II (%)	P.III (%)	
1	Observation/Games	98	95	98	97	75	85	88	83
2	Discussion	98	99	92	97	78	89	88	85
3	Presenting Discussion and Observation Result	0	51	44	47	0	44	44	44
4	Attention to Teachers	79	88	88	85	73	81	91	82
5	Asking Ability	63	57	88	69	58	59	76	64
6	Answering Questions	73	79	90	81	68	70	77	72
Mean (%)					79				72

In the first meeting in experiment class, students did an observation in the school garden and discussed the components of ecosystem. By doing an observation, students were expected to find the components of ecosystem independently. In the second meeting, students enjoyed *Food Fight Game*. Through this game, students were able to: find the relation between components; the interdependence between components; explain how energy flowed in food chain; explain about producer, consumer, carnivore, herbivore, omnivore, interaction, food chain, food web, and food pyramid.

This game was done in group consisted of 8 students. Each group simulated food chain and food web that they arranged. Each student in the group would play a role as a living thing in the food chain made from apron. Apron was made by the students consisted of living thing picture that they played. The game was started by the formulation of food chain and food web by each group. The fastest group that made a correct food chain and food web won the game. After that other groups were asked to join the champion group according to their role and formulated new food chain.

In the third meeting, students did an experiment to make a simple aquarium from the used bottle, watched and observed a video about interaction pattern of living things, conducted a discussion and presentation. Through experiment, students got knowledge about the components of water ecosystem and the interaction between components whether between biotic and abiotic. Through video observation, students got knowledge about interaction between living things.

Learning process in control class was done in three meetings. During learning process, students' activities in both experiment and control classes were observed. The observation was conducted by the researcher from the beginning to the end of learning process. The activities observed in experiment class included the observation of ecosystem component in the school garden; students' activity when enjoying the game to simulate food chain and food web; discussion activity; presentation of the discussion result; students' attention towards teacher's explanation; students' activeness in asking and answering question during learning process.

Based on the Table 1 the observation, games, and discussion in experimental class and control class have the highest percentage. This is because the observation outside and the learning process using games has never been done in the experimental before, so, the students became more attentive to the information inside of materials. Most students are enthusiastic and follow the learning process

based on the working sheets. The discussion have proven make students had good cooperation where the students are involved in doing their exercise and doing discussion. This is because the students directly interact to their groupmate. They are not only sitting and listening to the materials from the teachers. The asking ability from the students was still low since the students are still shy in asking questions, especially to the teachers or the presenter in the presentation. Students are happier and fun to discuss things with their groups

The presentation of discussion's result was still low in the experimental class where the average score is 47%, it is because the limit of learning time, so, not all group are able to present their discussions. But, when the teachers ask the students to present their discussion, most of them are brave to present the result of their group discussion.

Based on the observation of students' activity, the control class got lower overall percentage to all activities than the experimental class. The observation of picture in discussion sheets show that most students are enthusiastic, even if, there are still some students who do not want to do the observation. This is because the observation is not based on the real object making the students less motivated to follow. Likewise, the asking ability in experimental class is relatively low. The activity of presenting the observation and discussion is still low, since there is a limited time of the learning activity. Besides, there are many students who are still not really brave to present their discussion's result in front of the class. Thus, teachers should be able to push students more in presenting their discussion's result.

Students' activity was relatively more active in experimental class since it has different way than the previous ones. This is in line with the opinion of Nordgren (2013) stating that students' motivation are increasing with making the learning materials near with students' life and interest. So, it will increase their curiosity. This is supported by students' opinion stating 93% students are interested to learning process with Bioedutainment Food Fight Game and 90% students like the strategy of Bioedutainment in ecosystem material. Since the students felt happy to be able to be actively involved in the learning process. Like hwat has been stated by Rigas and Ayad (2010), interesting class condition makes students' activeness to follow the learning process increased. The attracting learning condition can make the students happy in following and understanding the learning materials (Setyoningrum 2007).

The result of the research in learning result about the average score of Pretest and Post test, the final score, and classical passing grade are shown in **Table 2**.

Table 2. Students' Learning Result in the Experimental and Control Class

Data	Experimental Class	Control Class
Total of Students	32	32
Average prestest score	62	63
Average posttest score	84	78
Students who pass	30	20
Students who do not pass	2	12
Classical passing score	93.75	62.50
Average of the Final Score	84	77

Based on the table, it is obtained that the average score of the post test, average final score, and classical passing grade of the experimental class is higher than the control class. In order to know the difference of average post test score in the experimental class and control class, the researcher did one side t-test. The t-test score obtained t_{count} of 2,819 which is higher than t_{table}, 1,998, with the reliability of 5%. It can be concluded that the post test score of the experimental class is better than the control class. In order to know the improvement of students' learning result (pretest and post test) about ecosystem, the researcher did gain normal test. The result of N-gain test showed that the g-score of the experimental and control class is in the medium category. Experimental class obtains *g* score of 0.6 while the control class was lower with 0,4.

Learning process with Bioedutainment strategy using Food Fight Game can give students positive impacts. The educative game can give students meaningful environment. It allows students to describe and relate the connection of the learning materials with the topics. Besides, classroom games is proved to improve students' motivation and involvement in learning (Altamirano and Jaurez 2013).

Learning activity with Bio-edutainment Food FightGame strategy can involve all students, so, it raises an active learning condition in the classroom. When the teachers applying the active learning strategy, teachers will be able to spend the time helping students' developing their understanding and skills more than transferring the information only (Eison 2010). Correlated to Aguado (2009), applying active learning orientation can offer the students interesting alternatives which can improve students' interest and ability to learn the materials.

Bioedutainment Food Fight Game is a learning strategy which is centered to the students in the learning process. It invites them to explore the learning materials themselves. The learning process is centered to the students that it involve their activeness which means teachers should give students chances to think themselves, so, the learning materials can be remained memorized in their mind longer, easily memorized, and improving their ability in mastering the materials (Santiningtyas 2012). This thing have similar results with the research of Hackathorn et al (2011) and Tomcho & Foels (2008) that active learning makes students learning results get better that they can directly interact with the materials. De Haan (2009) states that learning process through discoveries and real time experience can be done through tools, materials, or learning materials, and, teachers, as the facilitators, allow the students to get as many as experience optimally. The real experience which is experienced by students give them knowledge and understanding which is hardly obtained only be lectures.

CONCLUSION

Based on the analysis of data and discussions, it can be concluded that the implementation of Bioedutainment Food Fight Game in ecosystem materials can influence the students' learning activity and result positively, especially students from SMP N 18 Semarang.

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