



The Effectiveness of Field Trip in Biology Learning towards Students' Increased Concern for Biodiversity Values

Nurhasnah, Mieke Miarsyah, Rusdi

Biology Education Program, FMIPA, Jakarta State University, Indonesia

e-mail: nurhasnahali@gmail.com

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ABSTRACT

Biodiversity possesses important benefits and values for life sustainability in the world. Students' concern for biodiversity has become one of important social competencies which should be cultivated in Biology learning. This research aimed to identify effectiveness of field trip method in Biology learning in grade X towards students' increased concern for biodiversity values. The research involved students of grade X SMAN 96 Jakarta during the odd semester of school year 2017-2018. The sample consisted of two student groups, grade X MIPA 1 (experiment group) and grade X MIPA 2 (control group). The research employed a quasi-experiment method with a post-test only control group design. Questionnaires on students' concern for biodiversity were used. Data analysis was conducted using independent samples t-test with $\alpha=0,05$. The results of analysis show that field trip method is effective in increasing students' concern for biodiversity values.

Keywords: Field Trip, Concern, Biodiversity Values

INTRODUCTION

The advancement of socio-economics in human life has damaged the environment and caused several species extinctions. Indonesia ranked 5th among 20 countries whose species are endangered. There are roughly 1126 endangered species, consisting of mammals, reptiles, birds, amphibians, fish and molluscs (Sutarno, 2014). In general, Biology learning materials in grade X SMA includes biodiversity and ecology. Therefore, students' concern for biodiversity and its values and benefits is important and it needs to be nurtured through learning. It shall, hopefully, become the basic foundation of students' growing social concern for any phenomena threatening biodiversity in their minds as future generations.

Field trip method can be used in conducting Biology learning, especially concerning biodiversity and ecology.

According to Nabors et al. (2009), there are benefits which can be gained from using the method: (1) to enrich and expand curriculum, (2) to strengthen students' observation skills by involving them fully in sensoric activities, (3) to increase students' knowledge and understanding towards facts in the field, and (4) to develop students' social concern for community and environment.

Field trip method can be designed to provide direct experience, stimulate students' interest and motivation in understanding knowledge, strengthen the relevance of learning process with a given learning object, improve observation skills and perception and develop their social and personal skills (Behrendt & Franklin, 2009). The usage of field trip method in natural sciences learning has a power to give meaning to learning, promoting students' social-personal development (Patrick, 2010). Field trip is a kind of experience which develops students' initial

knowledge and nurtures their understanding and high learning motivation (Rieger, 2010). During a field trip, students can interact with real learning objects.

METHOD

This research employed a quasi-experimental method and a post-test only control design with students' concern for biodiversity values as a dependent variable.

The research subject population consisted of all students of SMAN 96 Jakarta. The accessible population were all students of grade X, SMAN 96 Jakarta. The selection was done using purposive sampling. The selection of grade X as accessible population, experiment group, control group and instrument test group in the study was done using Cluster Random Sampling. The experiment group included students who had finished Biology class during the odd semester and attended a field trip in a natural ecosystem. The control group consisted of students who had finished Biology class in the odd semester but did not attend any field trip. The location of the field trip was Pantai Indah Kapuk Mangrove Ecopark and Education centre in West Jakarta and its surrounding area.

The research data were accumulated in form of scores using questionnaires on students' concern for biodiversity. The questionnaires were administered at the end of the odd semester in school year 2017-2018. The instruments used in this study were tested using construct validity and substantive tests through experts' validation. The empiric validity from the instruments used in this study was tested using product moment correlation. The reliability calculation on instrument items which were considered valid used Cronbach's alpha equation and resulted in $\alpha=0.95$. The instruments then were administered to both groups. The first group, experiment group, consisted of

students of grade X MIPA 1 who participated in a field trip at the end of Biology class in the odd semester. The second group, control group, consisted of students of grade X MIPA 2 who did not participate in any field trip at the end of Biology class in the odd semester.

RESULTS AND DISCUSSION

The results of research were data scores on students' concern for biodiversity values from both student groups (experiment and control groups). The scores were converted into numbers which represented degrees of students' concern for biodiversity values based on the Minimum Mastery Criteria. The data were analysed using several steps: Data Description, Normality Test, Homogeneity Tests and Hypotheses Test.

Students' Concern for Biodiversity Values in the Experiment Group (with Field Trip)

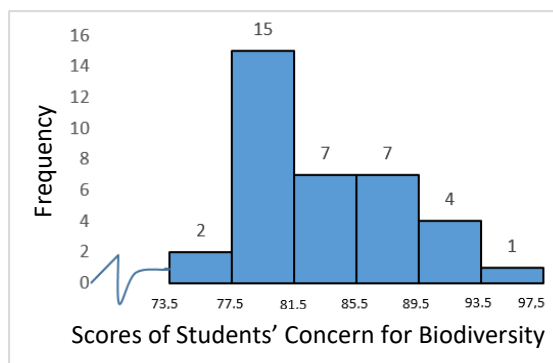


Figure 1. The Scores of Students' Concern for Biodiversity Values in the Experiment Group (with Field Trip)

Based on the research data, in the experiment group with field trip, the lowest score of students' concern for biodiversity values is 74 while the highest score is 96, with the average scores of 83,17. These scores suggest that 64% students of the group have excellent degree of concern (their scores are greater than 80), while 33% students of the group have good degree of concern (their scores range

between 75 – 80). Only 3% students have low degree of concern, having scores of 74 (lower than 75). The data description is presented in the figure1.

Students' Concern for Biodiversity Values in the Control Group (without Field Trip)

In the control group, the lowest score of students' concern for biodiversity values is 61 and the highest score is 86, with the average scores of 74,42. 41,6% students have the lowest degree of concern (their scores range between 75-80). Only 22% students have good degree of concern (their scores range between 81 – 86). The data description is presented in figure 2.

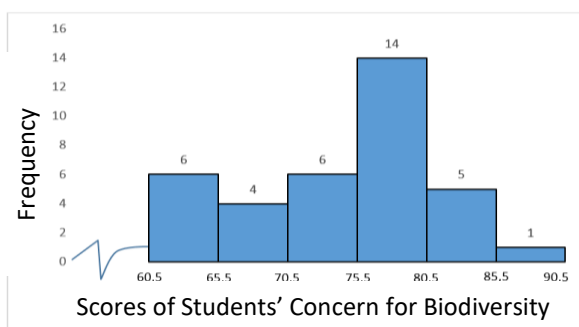


Figure 2. Scores of Students' Concern for Biodiversity Values in the Control Group (without Field Trip)

The results of data normality test suggest that each data group is normally distributed. The results of normality test on the data from both groups are presented in the following table 1.

Table 1. The Recapitulation of the Results of Data Normality Test on Students' Concern for Biodiversity Values

No	Data	P value	A	conclusion
1	Field Trip Class	0,448	0,05	Normal
2	Control Class	0,248	0,05	Normal

The two data groups were homogeneous, with sig values > 0,05. The hypothesis tests using Independent samples t-test of $\alpha=0,05$ with SPSS.16 resulted in

output sig=0,000 (sig<0.05). The results of hypothesis tests are presented in table 2.

Table 2. The Result of Hypothesis Tests using Independent Samples t-test with SPSS.16

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% Confidence Interval of Difference	
Equal Variances assumed	2.534	.116	6.082	70	.000	8.750	1.439	5.881	11.619
Equal Variances not assumed			6.082	66.326	.000	8.750	1.439	5.878	11.622

Based on the results of hypothesis tests, a value of sig.=0,000 was achieved. This suggests that the usage of field trip method in Biology learning in grade X MIPA has good effectiveness in nurturing or enhancing students' concern for biodiversity values. The average scores from both groups are 83,17 for the experiment class (field trip) and 74,42 for the control class (without field trip). Both average scores suggest that students' concern for biodiversity values of the students who attended the field trip were higher than the one of the students who didn't attend the field trip.

Previous related studies suggest that field trip gives positive results in connecting a learning process involving behavior to personal development and environment. Yulianti and Martuti (2014) conclude that a field trip method has significant influences towards the achievement of learning goals and students' concern for environment. Shakil et al. (2011) posits that the utilization of field trip method in learning may accelerate learning progress, provide a practical approach to curriculum and develop students' interest in learning.

Field trip can be designed as a part of learning activities outside formal learning hours. The method may improve students' learning motivation and capabilities in associating the concepts they learn in the classroom, strengthen their learning

interest and develop their higher thinking strategy (Behrendt & Franklin, 2014). A well-organised field trip is one of the best ways to nurture students' concern for their environment (Guler & Afacan, 2013).

In the Biology learning process, the field trip method allowed students to directly interact with the biodiversity they had learnt in the classroom in its natural habitat. Through the field trip to Pantai Indah Kapuk Mangrove Ecopark and Education centre in West Jakarta, students had direct experiences with various species in their natural habitat. They would observe and identify various species that were unfamiliar to them. This type of experience increased their knowledge or strengthened their basic knowledge on various organisms, motivating them to know further about values, functions and benefits of biodiversity for humanity and environment. Through the field trip, students also performed direct observation towards positive/negative behaviors of people who lived near the location of the field trip or visitors. Examples of negative behaviors observed during the field trip were the fishermen would throw away fish they got which did not measure up to their expectation, irresponsible visitors would dump their garbage around the Mangrove water area, and other irresponsible actions which would endanger the biodiversity. Students would also observe how the development of infrastructures around the residential site had greatly reduced the portion of habitat in the mangrove ecosystem. Students would interview local people about their opinions regarding the biodiversity around them. Such activity provides the students with information on local people's knowledge and views towards biodiversity values. Such information would develop students' thinking strategy, formulating solution for the negative behaviors they had observed. Other experiences the students got from the field trip were a participation in the planting of Mangrove species in several

critical fields in the Mangrove site and the cleaning of the site from garbages. Such experiences would encourage students to be more active in maintaining biodiversity around them.

CONCLUSION

Based on the research questions and hypothesis testing, therefore it can be concluded that the usage of a field trip method in Biology learning in grade X is effective to nurture and develop students' concern for biodiversity values.

A field trip model is recommended for introducing natural resources with its various phenomena concretely in natural sciences learning, especially for Biology learning in grade X SMA or its equivalents. Hopefully, the field trip method can increase students' knowledge and understanding towards the importance of biodiversity and its values, functions and benefits for humanity survival.

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