



Effectiveness of Environmental Exploration Learning (Jas) Approach Assisted by Education Card

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Abstract

This study would analyze the effectiveness of JAS learning with media education card of biodiversity on biology learning outcome of students at SMAN 1 Limbangan. This is a Quasi-Experimental study by Nonequivalent Control Group Design. The population in this study were six classes' students of grade X in the odd semester of 2016/2017 academic year. The sample was taken by purposive sampling, X 5 and X 6 as experimental classes and X 2 as the control class. The results of the analysis showed the average of cognitive learning outcomes in experimental class is 85,42 with learning completeness of 91,89%, while the control class is 70.7 with learning completeness of 26.47%. Psychomotor learning outcome of experimental classes is 82,43. Affective learning outcome of the experimental class is 74,32. In general, teachers and students also responded very well to apply learning. This study concludes that the Natural Exploration Learning (Jelajah Alam sekitar / JAS, Indonesia) model with the education card is effective for learning outcomes of students at SMAN 1 Limbangan.

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INTRODUCTION

Biology as one branch of science has its own characteristics compared to other natural sciences. Learning biology means trying to recognize living things and their life processes in the environment so it requires approaches and methods that characterize and work in the development of the concept. Learners will get more educational values when they discover their own ideas about the natural surroundings through the activities of the scientific process. This has consequences for the learning pattern (Mulyani et al., 2008)

The interview with teachers of biology at SMA N 1 Limbangan revealed that teachers use lecturing methods in the classroom by utilizing various sources of learning media such as book packages and Student Worksheet. The implementation of learning (Teacher Centered Learning) is not focused on the students' learning activities (Student-Centered Learning). The first semester learning achievement of Biology in Biodiversity concept in 2015/2016 shows that 34,3% of 35 students were below KKM (Minimum Required Score, given <75). Therefore, it is necessary to apply media and various learning models for maximum learning outcomes.

The basic competences for Biodiversity concept has been stated in syllabus of KTSP for grade X. Based on the interviews with Biology teachers, the low learning outcomes on biodiversity materials due to the students difficulties in associating four principal sub-concepts of Biological Diversity to be discussed. Therefore, there is a need for variation of learning approach that could optimize students' learning outcomes in biodiversity concept.

SMA Negeri 1 Limbangan is dominated by indigenous people of Limbangan. Limbangan is located at the slope of Mount Ungaran which has a high biological diversity. This could be optimized to be used by teachers primarily to introduce the concept of biodiversity. The school environment, includes parks, school field and its surrounding (rice fields and gardens) have the potential as learning source of biodiversity. Students can learn about natural events in the environment related to biodiversity concept. It is believed that the application of the approach to the JAS learning can be applied and well received by students to optimize learning outcomes. Therefore, it is necessary to use a learning approach that can explore the natural environment around the students. The JAS learning approach is one of the innovative approaches on biology learning and other science studies characterized by utilizing the surrounding environment and its simulation as learning sources through scientific work, and followed by student-centered learning (Mulyani et al., 2008).

Various learning media can be used to support the achievement of learning objectives, one of those is the Education Card based on Mount Ungaran. Ungaran Mountain-based Education Card is a 9x6 card containing the group of classification and conservation status of different biodiversity including flora and fauna in Mount Ungaran. Education Card was expected to be applicable on biodiversity concept because it required the ability to observe, categorize and discuss biodiversity.

Based on existing problems in schools, the potentials, and possible efforts can be done, this study sought to integrate the JAS learning approach with Media Education Card in supporting the achievement of biodiversity learning objectives in SMA Negeri 1 Limbangan. Implementation of the JAS approach assisted by the Education Card was expected to sustain and complement the learning strategy used to utilize biology package book and Student Worksheet (LKS). Learning with this approach requires teachers to play a role in guiding students as facilitators and motivators in learning. JAS which assisted by Education Card is a learning strategy in accordance with Biodiversity concept so it is expected to optimize student learning outcomes, as well as to facilitate students in understanding the concept.

Learning with media card is proven to be effective. This is supported by Istifarini et al., (2012) which states that the learning process of tenth graders of SMA Negeri 2 Wonosobo about

virus learning-material by picture card media could make students to be more active and completeness of student achievement reached 83.87% .

Quantum Teaching Learning in a character-based and effective conservation-based Surrounding Natural Exploration (JAS) approach is applied to optimize students learning activities and results (Sari, 2013).

This study aimed to analyze the effectiveness of learning by JAS approach (JAS) guided by Education Card on high school students' learning outcomes of biodiversity.

RESEARCH METHODS

The study was conducted in the odd semester of the academic year 2016/2017. The design used in this research is quasi-experimental design with nonequivalent control group design. The samples used were three classes, with two experimental classes and one control class. Sampling was determined by purposive sampling technique. Data were collected by the test method, observation, and questionnaire.

Multiple-choices test were used to measure students' cognitive learning outcomes in biodiversity materials. The test had been tested for validity, reliability, difficulty level and discriminating power. Problem test was given at the beginning as a pretest and at the end of the meeting as a posttest. Observational methods were used to assess students' affective and psychomotor learning processes. The questionnaire method was used to evaluate student responses and the implementation of learning. The learning was done in the experimental class by using JAS approach with education card. Learning in the control class was like the lecturing method as is usually done by the teacher.

Analysis of research data was done on cognitive test results of students and the results of psychomotor and affective aspects, descriptive quantitative. The result of student and teacher responses was analyzed descriptively qualitative

RESULTS AND DISCUSSION

Students' cognitive learning outcomes on biodiversity learning materials using JAS approach with education card obtained from the score of pretest and posttest. Posttest score was used to determine students' classical completeness criteria while pretest aimed to know the level of students' initial ability before being given learning activities. The differentiation of students' experimental and control class learning outcomes is determined by the t-test.

The average of student learning outcomes are presented in Table 1 and the t-test results of the experimental and control classes are given in table 2.

Table 1 shows that the pretest score of the experimental class' students with the control class is not much different, but the classical posttest and experimental score is better than the control class.

Table 1 Average of Cognitive Learning Outcomes

Sources	Experimental Class	Control Class
Average of Pretest	40,53	39.25
Average of Posttest	85,42	70,77
Classical learning	91,89	26,47

Lanjutan tabel 2

Completeness (%)		
Number of students	74	34

This suggests that the use of the JAS-assisted education card approach in the experimental class give a positive contribution. Learning by the JAS approach with education card provided a fun and contextual learning experience. Contextual images contained in education card helped students to find concepts, motivate students to solve problems in groups, understand the classification and conservation status of flora fauna in Mount Ungaran through discussion activities and supported by exploration.

This is in line with Wenning (2011), "to give a more in-depth understanding of the sequences, contextualized examples were provided." Wenning emphasized that to provide a deeper understanding needs to be presented examples of contextual. The results of this study are in line with Suparmi *et al.* (2013) and Pratama *et al.* (2015) who mention that the Education Card which applied on energy concept was effective, as indicated by the achievement of the effectiveness indicators. The effectiveness of the JAS approach is explained by Winarni (2013) by showing the results of learning aspects of environmental caring attitude, process skills, and conceptual understanding in groups of students joining science lessons by JAS approach were better compared to groups of students who attend expository learning.

Based on the analysis of cognitive learning outcomes there are still some students who do not complete the required minimum score especially in the experimental class despite being treated with learning using the JAS approach. This was because several factors such as lack of focus on learning, body health, learning activities and uncertain mood also affect student learning outcomes. This can also be seen from student responses indicating that there are still some students who are less interested in biodiversity learning concept.

Experiment and control classes are significantly different. The t-test results from the experimental and control classes are in Table 2.

Tabel 2 The T-test of the deviation difference on posttest -pretest score from experiment and control class

Kelas	Average	T _{count}	t _{table}	Explanation
Experiment	85,42	11,46	1,667	There is a significant difference
Control	70,77			

Table 2 shows the significant difference of posttest and posttest score of experiment class and control with $t_{count} 10.09 > t_{table} 1.67$, so that null hypothesis (H_0) is rejected and it can be concluded that there is a significant difference between experiment and control class.

Student learning outcomes improvement of the cognitive domain were seen in the N-gain test. The N-gain test recapitulation is presented in Table 3.

Based on Table 3, it can be seen that students in the experimental class (57) who received higher N-gain criteria ($g > 0.7$) than the control class did not exist. The number of students who received the average N-gain criteria ($0.3 < g < 0.7$) in the experimental class are 17 and 34 in control class. There is no student received low criteria N-gain ($g < 0.3$) in the experimental and control class. This number has fulfilled the predefined effectiveness indicator that is $\geq 75\%$ into medium to high category.

Tabel 3 The N-gain test recapitulation.

Σ Students		N-gain category
Experiment class	Control class	
57	0	($g > 0,7$) High
17	34	($0,3 < g < 0,7$) Average
0	0	($g < 0,3$) Low
74	34	Total

It shows that achievement of the experimental class' N-gain is better than control class. The results indicate that learning by JAS approach assisted by valid education card on biodiversity learning material is effectively proven by improvement of students' cognitive learning outcomes. This is in accordance with research Sari (2013) who mentions that Quantum Teaching and learning by JAS approach based on character and conservation principle is effective to be applied to optimize students' activities and learning outcomes.

The affective learning outcomes in this study were obtained from the observation of students' attitude by observation sheet. Observed students' characteristics include 6 aspects: (1) readiness in receiving lessons; (2) cooperation; (3) actively inquiring; (4) honesty; (5) critical attitude; and (6) answering teacher questions.

In students' discussion, they were divided into five groups. Assessment of attitude was done by two observers. Each observer rated two and three groups. The summary of the affective aspects assessment of the experimental class students are presented in Table 4.

Tabel 4 Summary of students' affective domain assessment

Criteria	Experimental class
Very good	74,32%
Good	25,68%
Good enough	0,00%
Not good	0,00%

Table 4 shows that students' affective domain score of the experimental class is mostly in a very good criteria (74.32%) and 25.68% of them is in good criteria.

This proves that the JAS approach guided by education card give positive contribution in building affective aspect of students both from critical attitude and cooperation during the discussion, and presentation. The success of this research was in improving critical characteristic.

Based on the result of observation analysis, the affective aspect score of the students can be concluded that the experimental class with JAS learning assisted by the education card give positive contribution in the learning, so it can be found that the learning using the JAS approach is effective on students' affective learning outcomes.

Psychomotor assessment in this study was using game education card activity in the experimental group. This evaluation was done in the second week. Psychomotor assessment of students begun at the time the game card education took place. There were 2 indicators of assessment, namely: (1) The accuracy of students in performing the game card education procedures; (2) accuracy in writing the observations according to the material. Students' psychomotor learning outcomes are presented in table 5.

Table 5 Psychomotor Response Results Student

Criteria	Experiment
Very good	82,43%
Good	17,57%
Good enough	0,00%
Not good	0,00%

Table 5 shows that the psychomotor values of the experimental class are 82.43% of very good criteria and 17.57% of good criteria.

This shows that JAS learning approach assisted by education card on student learning outcomes was effective. It also applies to the affective and psychomotor aspects of students which are in very good and good criteria.

CONCLUSION

Based on the results and discussion, it can be concluded that the JAS learning approach assisted by the education card on biodiversity concept at grade X SMA N 1 Limbangan is effective.

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