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THE INFLUENCE OF ANIMALIA LEARNING DESIGN WITH EXPERIENTIAL MODEL TO SCHOOL'S SURROUNDING ENVIRONMENT

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Abstract

This research aims to determine the effect of applied animalia learning design with the model of Experiential *Jelajah Alam Sekitar* (EJAS) on learning outcomes and activities of students class X MIPA in senior high school 1 Ungaran. This research is quasi experimental design and it using posttest only control group design. Sample of this research were class X MIPA 6 (experimental class) and X MIPA 7 (control class), taken by cluster random sampling. Independent variable in this research is learning design with EJAS model on the topic of animalia, while depends variable is learning outcomes and students activities. The result of t-test showed that mean posttest value of experimental class is higher than control class, with classical completeness 92% (KKM ≥ 75). Based on the result the experimental class students' activities analysis showed that highest activity is motor activities (92.35%), writing activities (92.12%), cooperation activities (91.90%), analysis activities (82.40%), and oral activities (80.20%). In general, teacher and students gave a positive response to applied learning. Conclusion from this research is applied animalia learning design with EJAS model positive effect on learning outcomes and student's activities.

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INTRODUCTION

Animalia is one of biology materials given to X grade of SMA (Senior High School) students in the even term. Kingdom Animalia is divided in two parts, invertebrate and vertebrate. Invertebrate is a term for animals without backbone, while vertebrate is a term for animals with backbone. These animals live in every part of the environment on earth.

Animalia is a material in the syllabus of SMA based on 2013 curriculum regulated in Permendikbud No. 59 year 2014. Basic competence which should be reached in that material is students should be able to classify animals to the phylum based on anatomy and morphology observation and relate the observation to their life. The learning process in this material demands the students to observe many animals in their surroundings. The learning process invite them to their environment to ease their understanding upon the characteristics of every animals, therefore the students will be easily categorized the animals based on their phylum.

The result of the observation and interview to the teacher of Biology in SMA Negeri 1 Ungaran shows that the learning method applied in teaching Animalia is only using lectures, observation, discussion, and presentation. Observation done by the students tends to observe the animals than the real object. The result of the observation is supported by the other researchers proving that learning Animalia is dominated with lectures, discussion of information, and giving exercise (Sholihah (2010), Sistriyati (2012), Arafah (2012), and Lestari (2013)). Biology teachers use the surrounding environment as the source of learning process which frequency is still relatively low (Alimah & Marianti, 2015).

The learning process of biology will be better if the students can directly interact to the real object surround them. According to Alimah & Marianti (2015), biology is a part of natural science which study object is the nature and the environment surround it, thus, the learning process should be directly interacting to the nature. Relating biology to the nature is hoped to be able to develop students' potentials.

Learning process relating biology to the environment is the learning of the nature. The characteristics of learning to the nature are directly involving the nature and the students in giving intellectual apperception and emotional apperception. Therefore the surrounding environment will become the learning materials through empirical study like experiment, comparative study or observation, etc. Through the nature, the students will be more aware to preserve the environment around them (Tirtarahardja & Sulo, 2005).

The approach of learning supporting learning through nature is nature exploration (JAS / Jelajah Alam Sekitar) which is developed by the lecturer of biology department from Universitas Negeri Semarang. This approach is one of the innovations to learn biology which is characterized by the surrounding environment and its simulation of scientific work as the source of learning based on the students (Mulyani et al., 2008). JAS learning method emphasize on learning activity focused on real world situation, therefore the learning process can open the mindset of the students and able to make the students learn many concepts. It also makes them able to learn how to relate the learning result with the real world. The approach of JAS has 6 components, exploration, constructivism, scientific process, learning community, bio-edutainment, and authentic assessment.

The component in JAS should be integrated to the learning process. One of the researchers proves JAS component works less optimal is exist in Fitriyati (2011). The research was about the development of learning material in the form of comic with JAS as the approach. In the scoring aspect of JAS to this learning material, three components were reflected less maximally, these are: constructivism, scientific process, and authentic assessment. Therefore, there should be a learning material with good design that can be used with full reflection of JAS components.

Experiential Nature Exploration or EJAS is a learning model made based on the format of JAS approach. EJAS learning model developed by Alimah (2015) is a learning model which can provide direct experience to the students' learning process by exploring and direct interaction with the learning object outside of the environment as the main learning source of the students whether indooror outdoor to get the knowledge, skills, and behavior as the learning result. Six components of JAS are integrated in 5 phases of EJAS, exploration, interaction, communication, reflection, and evaluation.

Based on the background, this research is raised with title of "The Influence of Animalia Learning with Experiential Nature Exploration Model for High School students". This research is hoped to be influential to the learning activity and result of Science students of X grade from SMA Negeri 1 Ungaran.

METHOD

This research was done in SMA Negeri 1 Ungaran, located in Jl. Diponegoro No. 42 Ungaran, Semarang regency from April until May 2016. This research is a quasi experimental design with post test only controls group design. The population of this research is the X grade students of science class in SMA Negeri 1 Ungaran academic year 2015/2016 consist of 7 classes. The samples used are students of X grade from MIPA 6 class as the experimental class and X grade MIPA 7 class as the control group which was taken with cluster random sampling technique. The independent variable of this research was the learning design with EJAS in Animalia material while the dependent variable was the students' activities and their learning result.The obtained data was the cognitive learning results, psychomotoric learning results, affective learning result, students' activities, students' opinion, and teachers' opinion to the learning process. The data of students' cognitive learning result from post test score, psychomotoric learning result from exercise score, affective learning result, and students' activities were obtained from observation sheets. Students' opinion to the learning process was taken from the questionnaire. Teachers' opinions were taken from interview.

RESULT AND DISCUSSION

Cognitive learning result was obtained from the posttest score of students in the experimental class and control class in the end of the learning process. The data of students' post test was examined statistically by t-test to know experimental class students' post test score. From the data, the experimental class which was taught using EJAS has higher score in post test than the control class. Before doing the t-test, there was a normality test to know the data of the post test score to both samples whether both samples normal distribution or not. After both samples have normal distribution, the next part is doing parametric statistical test. The analysis of t-test result from students' post test result is delivered in this Table 1.

Table 1. The result of t-test score for students' post test score in the experimental and control class for Animalia subject in SMA Negeri 1 Ungaran

$\bar{X}_1$	$\bar{X}_2$	S_1^2	S_2^2	S	n_1	n_2	t_{count}	t_{table}
89.56	77.63	110.27	90.75	10.03	36	35	5.008	1.667

The result of analysis shows that t_{count} is 5,008 which is bigger than t_{table} (5%) 1,667, therefore it is the rejection region of H_0. It means the average score of post test from the experimental class is higher than the control class. Therefore this Animalia learning design has positive influence to students' post test score. It is because the combination of Animalia and EJAS is a real object in which animals existing around students' environment. Students were invited to directly observe animals from the environment that it eases them to understand the materials. This statement supports the research of Alimah & Susilo (2013) saying that the designs of EJAS make students understand their material more. Since students are not only learning textbook as the learning source, but also observing the object from the environment or nature. The implementation of Animalia with EJAS in the experimental class shows optimal learning results where the students' classical passing grade ability reaches 92% of passing. This result is portrayed in Table 2.

Table 2. The result of analysis to students' classical passing grade ability in the experimental class in learning Animalia with EJAS model in SMA Negeri 1 Ungaran

Subject	Experimental Class		Passing Grade
	Total	Percentage	
Students who pass	33	92%	≥75
Students who do not pass	3	8%	
Classical Passing Grade		92%	

Subject	Experimental Class		Passing Grade
	Total	Percentage	
Highest Score		100	
Lowest Score		56	

The data in Table 2 shows that the classical passing grade of students' learning result in the experimental class has reached the target of ≥ 85% students who pass. Therefore, Animalia learning with EJAS is applicable in the next learning. Optimal learning results from this research was because the model of Animalia learning with EJAS invite the students to be actively exploring the surrounding environment to reach their cognitive, affective, and psychomotoric. Environment as the basis in teaching the students are the conditional factors influencing their individual behavior and become the most important learning factor. Abdu (2013), state that surrounding environment is a learning source directing students to maximize their learning ability and giving direct experience to them.

The use of real object as the learning source of exploration phase in EJAS provides students chance to directly interact with object using their senses. Students can touch and observe the animal directly that giving them concrete experience of learning. Meanwhile, the use of animal picture in the control class cannot provide students direct chance to see the overall morphology from the animals. Pictures are visual symbol which is using seeing as an abstract sense. According to the cone of experience of Edgar Dale, the more concrete the students learn the materials the more experience they have. Dale explains that more than 90% of the materials can be memorized by the students if they use real object comparing to only picture in 30%. In the other hand, 97.2% students stated that Animalia learning with EJAS give them more impression to their memories. Teachers also stated that students can memorize more on the materials because they can see the animals directly. Siswati (2012) says that students who observe real object will remain their memory longer than who are not.

Learning Animalia using real object is easy to be accepted by students. Students easily absorb the information given by the teachers. The information got by the students through their sense as the result of the interaction with the animals are included to the short-term senses saving system. Direct interactions to animals give students intention that they never experience before. The intention is continuously processed to the short-term memory (Styles in Julianto & Etsem, 2011). The information inside of the short-term memory will remain exist with rehearsal and encoding saved to the long-term ones. The use of real object is one of the forms of rehearsal or encoding of information. Time by time, this short memory is potentially promoted as the long-term ones (Rifa'i & Anni, 2012).

The success of application of Animalia with EJAS happened since students got several stimuli. Stimuli given to the students include observing video of Animalia, making projects of mummified animals, observing the taxidermy of animals, communicating the observation results, making mind mapping of animals' classifications, making comparative posters of animals' body, and doing exhibition. The learning process gives basic stimulus to the students that giving them positive response (Dianawati, 2013). The chains of stimuli in the learning of Animalia with EJAS stimulate students' critical thinking. Alimah (2012), explains that EJAS can be used to improve students' critical thinking that make students more understand regarding Animalia's material.

The use of video in the beginning of the class is the initiate stimulus given to the students making them motivated and interested to follow the learning process. The video shows many kinds of invertebrate and vertebrate animals specified on their habitat, living ways, reproductions, and the role. Video is an audiovisual medium giving students information better since it has picture and sound. Observing video makes the learning process become more effective and active since the medium is giving students' real picture of the animals. According to Yusriya (2014), audiovisual medium can make students know real living object projected in the classroom allowing the students to be in the same atmosphere as inside of the video.

Project exercise of animals' mummification motivates the students to be actively participating in the learning process. The participation involves them planning and making the project. It makes them more independent, responsible, and productive. This kind of exercise stimulates the students in planning projects and exploring the environment to find the animals for the project.

Thus, this real experience can make students understand the materials maximally. Susilowati (2013) states that project-based learning has positive outcome for students' learning result.

Animals' mummification project makes students enthusiast to be actively involved in physical activities from killing the animals until mummifying it, therefore there will be a fun learning environment. The statement is supported with students' opinion saying that 83.5% students become more active during learning session and 92% students say that the combined model makes the learning environment be more attracting. Teachers' interview state that Animalia with EJAS can make students active, enthusiastic, and interesting in learning since they are faced directly to the observed animals. This model can create a dynamic and positive atmosphere of psychology to students. It raises their interest and gives them meaningful knowledge to be actively involved in all process of learning (Alimah & Marianti, 2015:102).

Students' activeness can be seen from their learning activities. The observed activities in this research were writing, speaking, analyzing, motoric, and cooperating. The percentage of those aspects is delivered in Table 3.

Table 3. The percentage of students' activity score in experimental class of learning Animalia with EJAS in SMA Negeri 1 Ungaran

Activity Types	Experimental Class (%)
Writing	92.12
Speaking	80.20
Analyzing	82.40
Motoric	92.35
Cooperating	91.90

Observing invertebrate and vertebrate's animals' taxidermy from students' project raise high motoric activity on them (Table 3) it is proved with their active involvement in the process of observing animals. Alimah & Susilo (2013) state that Animalia learning with EJAS making students generally active in following the learning process. It raises their responsibility and accuracy in doing the observation of animals' characteristics. Invertebrates, for instance, grasshopper is placed in petrified cup to ease students in identifying the characteristics of grasshoppers, including their body symmetry, body condition, body form, body structure, movement organ, body arrangement, and body anatomy. The characteristics of grasshoppers is then written in students' worksheet, therefore it makes their writing activity higher (Tabel 3).

Observing animals is designed in group in interaction phase. Group learning motivates the students to cooperate more (Table 3). Group activity facilitates students cooperating with each other and shares their opinion with the group members. Students' tolerance can be seen by the existence of cooperation, appreciation, and less domination. Students stated that this learning model trains them to socialize and cooperate to others. Kholina (2013), says say that group activities make students able to share their ideas and help each other.

When the students observe animals, science process is started. Scientific activity is used to apply scientific method, therefore the knowledge given by them is rational and valid. Students' direct observation provides them chance of exploration and discoveries. Students' opinion shows that 83,4% students say that they become more skillful in finding their own concept of Animalia. Teachers also stated that the learning design for Animalia with EJAS train students in finding their own learing concept by direct observation. Observing animals make students get direct experience and chances to construct their own knowledge, therefore the knowledge earned will be more meaningful. Constructivism theory says that students should be able to find and transform complex information to themselves (Rifa'i & Anni, 2012).

Observation of animals gives more analyzing activity for students (Table 3). Students analyze with relating the concept of new knowledge obtained from observing animals with relevant concept in observing animalia and mummifying animals, therefore there will be a building of meaningful logic to them. This thing is in line with the theory of meaningful learning from Ausubel saying that meaningful learning is a process of relating new information with relevant concept in students' cognitive structure (Dahar in Rifa'i & Anni, 2012). Direct observation to animals is also in line with the principle of learning by doing that make students understand the concept more. This statement is supported with students' opinion saying that 100% of them understand the Animalia more. Teachers also stated similar thing based on the experience of seeing direct

object by the students. Siswati (2012) says that learning direct object makes the learning material more meaningful and helpful to students.

Students have to report the observation result in building the knowledge concept with the other group. This activity is the implementation of communicating phase. The presenter group delivers their presentation of observing animals in the form of oral communication to teachers and students in the other groups. The groups of presenter give chances to other group to ask their presentation's materials. This activity trains students' communication skills. This activity motivates them to speak up (Table 3) in asking questions, responding, or stating opinion. Students' responsive behavior in Animalia with EJAS is proved with students' active attitude while they still have materials they do not understand. Students also gave their opinion and answering questions from teachers. The students' opinion show 88.69% students say that learning Animalia with EJAS facilitate them to opine and communicate to other students. Alimah (2014) states that communication phase in EJAS is used to train students communicate with good norms and empathy.

The process of learning reflection is used to know the misconception in students' knowledge of Animalia. The phase of reflection is done in the end of the learning process through oral questions from the techers regarding the concept of Animalia when students observe the animals. Irez and Cakir (2006) states that people's reflection can make them understand themselves, acknowledging their problems, and thinking the best solution to solve the problems. The learning process is inseparable from evaluation. Evaluation should be based on authentic assessment during the learning process. Students are scored based on their attitudes and learning activities. Therefore students' progress is valued from their process, instead of only from their final score.

Making mind mapping of animals' classification can optimize students' mastery upon the materials. Students are free to show their creativity in mapping the materials in a very attracting look and easily understood way. Mind mapping is also suitable to materials which need complicated understanding, like Animalia. Mind mapping is very good to summarize complicated memory. It helps students in memorizing the materials. Fauzia (2015) state that mind mapping is effective to improve students' memorizing ability.

The exercise of creating posters as the comparison of animals' body complexity can optimize the learning process. The exercise was given in group in which students are able to share their ideas with their friends. Students are also able to develop their creativity. According to Munawaroh (2013), creating posters can help students in appreciating arts. The posters combine the elements of lines, pictures, words, and colors making it more interesting in communicating information. Posters made by students contain pictures related to the complexity of diploblastic and triploblastic animals, body's symmetry, body's cavility, reproduction, and animals' examples. The posters are able to accelerate students understanding in comparing animals.

The design of EJAS makes students producing animals' taxidermy and posters. These products are exhibited in an exhibition. This exhibition is planes in a form of stands of gallery walk. Every gallery is guarded by one group member, while the other members can go to the other stands. According to Widarti (2013) gallery walks demand students to be actively involved in the learning process. The learning is planned to facilitate them learning the materials by themselves or going to every stands. Students can learn from the other students' knowledge about their posters and the taxidermy. Students' speaking ability were also trained and developed through questions and answer section. Students are also interested and happy in the learning process.

All processes of learning Animalia can be done based on the main and basic competence. Students can obtain conceptual understanding from the video of Animalia. The projects of animals' taxidermy given to them motivating them to think critically in planning the project and train their ability of doing mummification. Students' factual knowledge is obtain when students' know several mummies of invertebrate and vertebrata animals. These observations make students understand the learning concepts since it has concrete objects. Mind mapping and posters accelerated students' understanding in comparing different animals. The advantages from Animalia with EJAS make students able to categorize animals to the pyhlum based on the anatomy and morphology directly.

CONCLUSION

Based on the results of the research, it can be summed up that Animalia with EJAS influence students positively to the learning activity and results of X grade students of science class in SMA Negeri 1 Ungaran.

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