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## Bioedutainment Strategy with Role Playing in Neural System Learning

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### Abstract

This research aims to identify the activities, study results, attitudes and relationships of study results with students' attitudes on the application of bioedutainment strategies with the role playing material of the nervous system. This research uses pre-experimental design design with one group pretest-posttest design. The population in this research is all students of class XI IPA SMA Negeri 7 Semarang with two classes as a sample determined by purposive sampling. The independent variable is a bioedutainment strategy with role playing. The dependent variable is activity, study result, and attitude. Control variables include teachers, lesson hours, curriculum, and face-to-face time. Student activity is analyzed descriptively percentage. Study results were analyzed with N-gain and quantitative. Attitudes are analyzed descriptively percentage. Student activities show average is active criteria (77%). Study results achieve classical mastery (86.5%). The mean N-gain of students in both classes included moderate criteria (0.44 and 0.40). Students' attitudes toward psychotropic and addictive abuse show very high criteria (92% and 86%). Study results with attitudes toward psychotropic abuse and addictive substances have strong correlations (0.705 and 0.610). Teachers and students respond positively and well. Conclusion: bioedutainment strategy with role playing has a positive effect on the activity, study results and attitudes of students and there is a significant relationship between study results and student attitudes.

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## INTRODUCTION

In biology learning that is closely related to daily life, students are can not only memorize the material but also need to observe and understand. To facilitate students' understanding, there needs to be learning innovation so that students become passionate, have motivation to learn, and enthusiastic accept the lessons at school. If students are happy, then students will be easy in following the lesson and it can affect study results. According to Hamid (2014: 12) in this case, the most important thing to do is create a comfortable and fun classroom for the students.

Department Regulation of Education and Culture of Indonesia Republic No. 103/2014 about learning in primary and secondary education stated that in the implementation of Curriculum 2013, it is advisable to use a scientific approach with learning models of inquiry based learning, discovery learning, project based learning and problem based learning. Discovery learning is one of the inventive learning that leads learners to understand concepts, meanings, and relationships, through an intuitive process to finally come to a conclusion (Kemendikbud, 2013). In discovery learning, activities or learning is designed in such a way that students can find the concepts and principles through its own mental processes. Such learning is referred to as active learning, where learning is student-centered, not teacher-centered.

Teacher-centered learning will create teacher-dominated learning. According Slavin (2008) selection of appropriate learning strategies determine the success rate of teachers in creating a student-centered learning atmosphere, so that learning is not monotonous. One of the best learning strategies used in creating student-centered learning is the bioedutainment strategy. The bioedutainment strategy is an entertaining and fun biology learning strategy. Alimah and Aditya (2016: 98) stated that in this bioedutainment strategy contained the main elements of science and science discovery, work skills, cooperation, education games, competition, challenge, and sportsmanship. Everything is packed in the form of learning that is entertaining and fun. The research of Proboningrum (2012) on the implementation of bioedutainment strategy states that with the learning of bioedutainment students feel more comfortable, because there is no fear in actualizing their ability so that students are more daring in expressing opinions and feel comfortable to follow the learning from the teacher. According to Nurwahyunani et al., (2014) in her research concluded that study results using bioedutainment based learning strategies have realize the criteria of success indicators of learning and students become active in the learning process.

Learning with role playing method can improve study results and student activities, because students are invited to play while learning. One of the advantages of the role playing method is able to attract the attention of children, so the classroom atmosphere is more alive. If the classroom atmosphere is more alive, it will grow the spirit in the learners to follow the process of teaching and learning in the classroom. In accordance with the opinion Haq *et al.*, (2014) the more atmosphere in the classroom, it is certain the student activity will be higher too.

Based on observations in several schools in Semarang, it is known that teachers still use lecture and discussion methods. The methods can not be said to be a bad method because there are some material to be delivered through lectures and discussions. In biology learning, teachers have applied strategies and methods such as material presentation from students and practicum but have never implemented bioedutainment strategy with role playing method. From the questionnaire, it is found that 86% of students have difficulties in studying biology on the basis of the number of materials that must be memorized. In general, the fact is teachers still use lecture methods and discussions in learning and students who have difficulty understanding biological materials because students still tend to memorize biological materials. Never before has bioedutainment strategy been applied with role playing method on neural system material also become one of reason to do this research.

In KD 3.10 and KD 3.11 there is a learning material that discusses the structure and function of cells in the regulatory system, and the discussion of the psychotropic effect on the regulatory system. A person's attitude affects toward behavior. Negative attitudes toward drug use will present behavior avoid from drugs, meaning not experimenting with any type of drug. On the contrary a positive attitude toward drug use will present behavior approach to drugs, meaning that someone will compromise and open the opportunity to experiment with drugs because of factors that come from themselves or from the around environment (Tommy *et al.*, 2006).

Through role playing, students can increase their ability to recognize and take into account their own feelings and feelings of others, they can have new behaviors in the face of difficult situations they are happening, and they can improve problem-solving skills. One characteristic of social problems that is easy to trace with the help of the role playing method is the student dilemma that arises when a person is caught in two contradictory values or between his interests and the interests of others who are usually difficult to faced young students, because his moral decisions tend to still very egocentric. By giving the material through role playing, students can be trained to deal with a problem and then make a decision. Misuse of psychotropic and addictive substances is no longer a matter related to a person's physical but social moral problems so that there needs to be a skill development and problem-solving attitude for students through this method. According to Joyce *et al.*, (2009) mentioned that there are four kinds of application of role playing method that can be used as a learning base in the learning curriculum, namely (1) exploration of feelings, (2) behavioral exploration, values and opinions, (3) development skills and problem-solving attitudes, and (4) material exploration to be discussed.

Learning using bioedutainment strategy with role playing method is expected to increase student activity and study results as well as improve self-protective attitude from abuse of psychotropic and addictive substances.

## **RESEARCH METHOD**

This study used a pre-experimental design with One Group Pretest-Posttest. The sample in this research is the students of class XI IPA 1 and XI IPA 2 SMA Negeri 7 Semarang which is determined using purposive sampling technique. The independent variable is a bioedutainment strategy with role playing. The dependent variable is activity, study result, and attitude. Control variables include teachers, number of lessons, curriculum, and face-to-face time. Research data includes activities, study results, attitudes. Student activity is analyzed descriptively percentage. Study results were analyzed by N-gain and quantitative. Attitudes are analyzed descriptively percentage.

The procedures prepared in this research consist of the preparation stage and the implementation stage. Preparatory stage: (1) Preparing learning tools; (2) Developing research instruments; (3) Conducting tests on pretest and posttest; (4) Analyze the test results that include the validity, reliability, differentiation and difficulty of using ANATES version 4.0.9. Implementation phase: (1) performing pretest; (2) Application of learning strategy of bioedutainment with role playing; (3) Observing student activities; (4) Conducting posttest; (5) Analyze student activity data, study results, student attitudes, learning implementation, student responses and teacher responses.

## RESULTS AND DISCUSSION

### Student Activity in Learning Bioedutainment Strategy with Role Playing

**Table 1** Recapitulation of student activity of class XI IPA 1 and class XI IPA 2 SMA Negeri 7 Semarang

Criteria	Percentage (%)	
	XI IPA 1	XI IPA 2
Very active	39%	11%
Active	61%	86%
Enough active	0%	3%
Less active	0%	0%
Percentage of student activities	79%	75%
Average in two classes	77%	

Based on Table 1 it can be seen that the percentage of student activity in 2 classes studied  $\geq 75\%$  of students in the category is very active and active in learning activities using bioedutainment strategy with role playing. It shows that in learning, students actively interact with teachers or other students and students follow the learning as expected. Student learning activities can be reflected from the activities undertaken during the learning process takes place. Assignment to role playing with different scripts in each group can increase student learning activities either individually or in groups, whereas classical discussion activities can create a conducive situation because learning with peers makes it easy to exchange thoughts and opinions based on experience gained in observation role playing. Student activity that include active is caused by the application of bioedutainment strategy with role playing. The bioedutainment strategy provides a fun and non-boring learning environment, while the role playing method lets students seek information through direct learning experiences conducted in groups. According to Ngabekti *et al.*, (2006) learning done in groups requires students to work complete a task together and foster student learning motivation, so that students are active in learning.

According to Christianti *et al.*, (2012) bioedutmentment-based biology learning can be applied anywhere and can be combined with methods such as discussion, outdoor learning, experimenting, education game, role playing, or other learning models but still appropriate with the aim of learning. Learning activities are carried out using instructional media available at school and distributing role playing script to each group. The division of the group is done by paired card game at the meeting before the first learning activity. Activities from the first day to the third, demanding students to be active and able to give real experience to the students, students also get a meaningful learning experience and easier to understand the material, so as to motivate students to learn and try to be active. In a study conducted by Haq *et al.* (2014) revealed that learning by role playing method can improve students' activity because students are invited to play while learning and work together to solve problems so that the classroom atmosphere is more lively and fun.

### Study Results of Students in Learning Bioedutainment Strategy with Role Playing

**Table 2** Recapitulation of percentage of study results

Explanation	I IPA 1	XI IPA 2
Amount of student	36	38
Highest value	87	37
Lowest value	57	50
Average	77	78

Student's complete	32	31
Student's no complete	4	5
Classical completeness each class (%)	89	34
Classical completeness of both classes	86,5%	

Based on Table 2 it is known that the average of students' classical completeness of both classes is 86.5. Positive study results are caused by several factors, among others, because the atmosphere of learning is fun and students are invited to experience activities directly. This is in accordance with the opinion Bhattacharjee & Somik (2013) which states that combining learning materials with experience of activities directly in the classroom will increase attention and comprehension. During the learning process ongoing the students look enthusiastic to follow the lesson because learning strategy of bioedutainment with role playing is student center learning. Student-centered learning atmosphere will make students more active, confident, and more interested in learning. In addition, in this study also uses lecture and discussion methods because not all the material can be delivered using the role playing method. The bioedutainment strategy with role playing can have a positive impact on study results of student. Learning by using appropriate strategies and methods of attracting many sources of learn, information, and communication will make it easier for students to understand the material. This is in accordance with the statement of Rigos and Ayad (2010) that the condition of fun is one factor that can improve study result of student.

The result of analysis improved study results (N-gain) is known that the students of class XI IPA 1 and class XI IPA 2 are included in medium category N-gain. The meaning is the difference between the pretest score and the posttest score shows a considerable increase. The full results are presented in Table 3.

**Table 3** Improved study results of student (N-gain)

Class	Average of pretest score	Average of posttest score	Max score	N-gain	Criteria
XI IPA 1	18	24	30	0,44	Medium
XI IPA 2	18	23	30	0,40	Medium

The bioedutainment strategy makes students feel happy in following the learning activities. Students will perform some learning activities such as singing material recognition songs, pairing game cards in group divisions and watching instructional videos. The role playing method also makes the students participate during the learning activities. Students will play roles, discuss each other in solving LDS and students will be with their group to make conclusions about the material. Park's research results (2012) explain that students will better to remember the learning materials if the knowledge is built based on the learning experience that has been done.

#### **Student Attitude after Learning Bioedutainment Strategy with Role Playing**

**Table 4** Recapitulation of students' attitude scores

No	Aspect	Percentage (%)	Criteria
1	Attitude to avoid misuse psychotropic substances	92	Very high
2	Attitude to avoid using addictive substances	86	Very high

Based on Table 4, the average percentage of scores per aspect was 92% and 86% in the criteria was very high. This shows that the implementation of bioedutainment strategy with role playing positively influences the students' attitude toward the misuse of psychotropic and addictive

substances in very high criteria. In learning, given apperception by displaying video instances of abuse cases of psychotropic and addictive substances among artists and students, then students do the discussion, the teacher gives moral messages to the students to stay away from and never experiment psychotropic drugs or addictive substances by displaying video related to that with the aim that students have the knowledge and character of a good attitude.

From the results of the data can be concluded that students in SMA N 7 Semarang have a negative attitude to abuse of psychotropic and addictive substances, which means not support and assume that if consuming psychotropic or addictive substances will harm yourself and others, this is one of them because students feel happy to the strategy and learning methods of the nervous system so that student achievement is also high. This is supported by Lisdiana (2010) in her research which states that learning the nervous system developed can improve students' positive attitude toward the prevention of drug abuse.

**Relationship between Study Results with Student Attitudes**

**Table 5** Results of correlation between study results with attitude toward psychotropic abuse

		Correlations	
		Study Results	Attitude toward psychotropic abuse
Study results	Pearson Correlation	1	.705**
	Sig. (2-tailed)		.000
	N	74	74
Attitude toward psychotropic abuse	Pearson Correlation	.705**	1
	Sig. (2-tailed)	.000	
	N	74	74

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Table 6** Results of correlation between study results with attitude toward the use of addictive substances

		Correlations	
		Study results	Attitude toward the use addictive substances
Study results	Pearson Correlation	1	.610**
	Sig. (2-tailed)		.000
	N	74	74
Attitude toward the use addictive substances	Pearson Correlation	.610**	1
	Sig. (2-tailed)	.000	
	N	74	74

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Based on table 5 and table 6, it shows that there are strong correlation between study results with students' attitudes toward psychotropic and addictive abuse with the value of Person Correlation are 0.705 and 0.610. It's refer to that not only high the value of study results, but also the students 'attitudes toward the misuse of psychotropic and addictive substances because the results of learning in the research can be interpreted as students' knowledge about the various adverse effects that occur when misusing psychotropic and addictive substances obtained from learning. If students are get sufficient knowledge about the adverse effects, students will tend to be able to prevent abuse. According to Lisdiana (2010) prevention needs to be done since elementary school children to college, the school is an ideal institution in the effort to prevent drug abuse, since most users are children and adolescents of school age.

According to a study by Herbiadi *et al.*, (2012) in high school students stated a strong and positive relationship between attitudes with study results and the correlation coefficient is 0.576. This is also supported by Hasanuddin (2011) in his research stating that there is a significant relationship between the study results with the attitude of students that the greater the study results obtained by students will form a positive attitude on the students themselves.

### Student's Response to Learning

Student response is one of the factors that influence the success of the learning process. Questionnaire responses of students are given at the end of learning to know the student's response to the whole learning process. Based on the data of the students' responses, class XI IPA 1 and class XI IPA 2 gave good responses with the succession percentage of 87% and 88%. The average student response from both classes is 87.5% with good criteria. Students feel happy with the existence of education game activities in the learning process, students also feel happy to find material information through direct observation activities in the student environment, because the learning atmosphere is more fun than when learning with the usual methods applied so as to arouse students' enthusiasm in learning.

Learning with role playing method gives students the opportunity to train group cohesion directly or indirectly, feel more challenged to compete with other groups during role playing. Implementation of bioedutainment strategy with role playing adds the spirit of students to learn while playing. Students do not feel pressured by material that many students can easily convey and understand. Students agree in this learning attracts students' attention, makes students more passionate and motivated, becomes active, and adds group cohesiveness.

### Teacher's Response to Learning

Based on the results of questionnaires and interviews with teachers on learning using bioedutainment strategy with role playing on nerve system material, obtained a positive response. According to the teacher, learning is more interesting and can inspire students to learn and compete in a sporty manner. Study results are also improved, because students do not only memorize the material but also find their own concepts through the role and group discussion so the material is easy to remember by the students.

In the implementation of this strategy and learning model there are shortcomings, such as time and place. This learning activity, requires good time management, comprehension and enthusiasm of students are difficult to guess so that sometimes the time spent in learning is not in accordance with the plan. Implementation of these strategies and methods also requires more attention by teachers, because students often underestimate the preparation for role playing, planning in making the script role playing should also need to prepare well for the learning can run smoothly. This research can be applied in the classroom, but also can be re-created by subject teachers so that the learning activity of material can be easily conveyed to the students.

### Learning Implementation

**Table 7** Recapitulation of the implementation of learning

No	Class	Average (%)	Classical average(%)	Criteria
1	XI IPA 1	84	83	Very high
2	XI IPA 2	78		

Based on the observations made and the data that have been analyzed, the implementation of learning strategy of bioedutainment with role playing is included in very high category. This can be

seen in Table 7, the percentage in class XI IPA 1 and class XI IPA 2 is 83%. In this lesson, the teacher almost performs all observed aspects of the observer. In learning strategy of bioedutainment with role playing there are indeed some obstacles because learning is done in the classroom. The implementation of this learning requires considerable space and good classroom coordination. For that, teachers are required to have the readiness and good skills so that learning goes according to plan.

## CONCLUSION

Based on the result of the research, it can be concluded that (1) the implementation of bioedutainment strategy with role playing on nerve system material in SMA Negeri 7 Semarang has positive effect on activity, study result and student attitude, (2) There is a significant relationship between the study results of the neural system and the students' attitudes.

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