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The Effectiveness of the Student Facilitator and Explaining Learning Model with a Roundhouse Diagram

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Abstract

Results of the observation shows that students are still passive during the learning process in which influence their learning achievement. Student Facilitator and Explaining (SFaE) learning model is effective to make the students explain the materials to train students express their ideas. This study combines *SFaE* with Roundhouse diagram to make students easier to understand and explain the materials. The research was conducted for the tenth grade students of *SMA N 1 Jekulo*. A purposive sampling was used with two classes as the sample. The T-test shows that the t-value is more than t-table for 2.71 > 1.67 with $\propto = 5\%$ which means H_0 is rejected, means that the average results of the experimental class is higher than the control. The analysis on students'activity in the experimantal class is 91.76% students are in the category of active until very active, and 8.33% are in the medium. In the control class, around 80.56% students are in the category of active until very active, and 19.44% are in the medium. In conclusion, the use of learning model Student Facilitator and Explaining (SFaE) with a Roundhouse diagram is effective to improve students'activity and achievement in the learning material of Virus.

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INTRODUCTION

Education is a learning process which cannot be separated from the teaching and learning process. A learning process is effective if all the components are supportive, for example student participation, appropriate learning model and supporting infrastructure, so that they can affect students' learning achievements (Fatimah et al. 2017). Student participation is shown by how they actively participating in discussions or when students explain material to their friends. Wafda et al. (2016) argue that good communication between students and teachers and students and students can support students to be more active during the learning process.

The observation results show that students still tend to be less active in expressing their ideas. Not all students participate actively in a group discussions. Based on the results of interviews with the Biology teachers, students still have difficulty in learning biology as indicated by the low students' learning achievements. One material that is considered quite difficult is Virus. Virus material is quite difficult because it is an abstract material that cannot be directly found or seen in students' daily lives.

Zulfikar et al. (2016) say that the lack of student activity during the learning process can be solved by carrying out the learning process using a model that can stimulate an active cooperation between students. One of the learning models that can be used is the Student Facilitator and Explaining (SFaE) learning model. The Student Facilitator and Explaining (SFaE) learning model is a communication-based learning that allows students to be able to read and write well, learn with others, receive and convey information (Huda, 2013). This model provides an opportunity for students to express their ideas to their friends and allows students who have been less active or less involved to participate in learning process.

Suprijono (2012) states that there are six steps in implementing the SFaE learning model: 1) The teacher conveys the competencies to be achieved, 2) The teacher demonstrates or presents the material, 3) The teacher provides opportunities for students to explain to their friends, 4) The teacher concludes the ideas or opinions of students, 5) The teacher explains all the material presented, and 6) Closing

Each learning models certainly has advantages and disadvantages. The advantages possessed by the SFaE learning model according to Huda (2013) are making the material presented clearer and more concrete, increasing student absorption because learning is done by demonstration, training students to become teachers, because students are given the opportunity to repeat the teacher's explanation that has been heard, support them to be the best in explaining teaching material, as well as knowing the ability of students to convey their ideas. Meanwhile, the disadvantages of the SFaE model is that, it is too hard for shy students to demonstrate what the teacher instructs, not all students have the opportunity to explain to their friends because of time constraints and the same opinion so that only some of them can appear, and it is not easy for students to briefly explain the teaching material.

Sari et al. (2016) say that the learning model would be maximized when combined with a learning technique that is in accordance with the learning material. In this research, the SFaE learning model will be combined with a Roundhouse diagram assignments. Roundhouse diagram is a learning technique for storing concepts in long-term memory and mastering the concept as a whole (Safitri et al., 2015). Mutlu (2013) argues that the Roundhouse diagram aims to help students learn and build new knowledge in a fun way. This technique is expected to help students understand the concept of material in the virus chapter, especially in virus replication material which has the characteristics of a continuous and related cycle of materials.

Based on the background that has been elaborated above, it is necessary to conduct a research about the effectiveness of Student Facilitator and Explaining (SFaE) as the learning model with the Roundhouse diagram on students' activities and achievements in Virus material.

METHODS

This research was conducted at *SMA N 1 Jekulo Kudus* in the academic year of 2018/2019. The

population of this study was all the students of *X MIPA* in *SMA N 1 Jekulo*. A purposive technique sample was used, it is a technique of choosing a sample with certain consideration (Sugiyono, 2016). The sample used was taken by the consideration based on the Biology teachers that taught the same classes. The sample was from two different classes, *X MIPA 4* as the experimental class and *X MIPA 5* as the control class.

It is a quasi experimental research with a non equivalent control group design. The data analyzed was the students' activities and learning data that were analyzed by statistical tests, and the questionnaire data of students and teacher which were analyzed descriptively.

RESULTS AND DISCUSSIONS

The aim of this study is to determine the effectiveness of a Student Facilitator and Explaining learning model with a Roundhouse diagram on the students' activities and learning achievements in Virus material. The SFaE learning model with the Roundhouse diagram is said to be effective if it meets these following indicators, (1) student learning achievement is ≥ 80% of school's Minimum Completion Criteria (*KKM)*, which is ≥ 65 in the experimental class, (2) the level of student activity in the category of active to very active reaches ≥ 90% of the number of students in the experimental class, (3) the increase in N-gain learning achievement of experimental class students was ≥ 75% of the number of students in the medium to high category, and (4) the learning achievement of the experimental class were significantly different and better than the control class.

The research results obtained from this research are cognitive learning result data as the main data, as well as supporting data in the form of experimental class student activity data, the questionnaire of students and teachers data towards the application of the SFaE learning model with Roundhouse diagram in Virus material.

Students' Learning Achievement

Cognitive learning achievements in this study were the posttest scores consisting of 25 multiple choice questions. The posttest results of the experimental class and control class were then tested using the t-test. The following table presents the learning achievements of the experimental class and the control class as well as the results of the t-test from the learning achievements of the experimental class and the control class.

Table 1 Students' Learning Scores

Data	Experimental class	Control class
The number of students	36	36
The average scores of pretest	42.22	42.33
The average scores of posttest	79	72.33

Table 2 T-test of The Experimental and Control Classes

Class	Mean	Df	$\propto$	t_{hitung}	t_{tabel}
Experimental	79	70	0.05	2.71	1.67
Control	72.33	70	0.05		

Table 1 shows that the student learning achievements (posttest scores) of the experimental class (79) were better than the control class (72.33). Meanwhile, in Table 2 shows that t count 2.71 with t table 1.67 at $\propto$ = 5%. From the results of the t test, it was decided if the t value was in the rejection area of H0 so that it could be concluded that the average of the experimental class was higher with a significant difference when compared to the average of the control class.

Student learning achievements of virus material can be said to be complete if the number of students whose scores have met the KKM, namely 65, reaches 85%. The final score of each student is obtained from the posttest score, the LDS score and the score for the assignment of making posters for the experimental class and the control class.

Table 3 Recapitulation of Students' Last Scores

Data	Class	
	Experimental	Control
The average score	87	75.67
The number of students passed	36	32
The number of students failed	0	4
The percentage of students who passed KKM	100%	88.89%

The percentage of students who meet the KKM for the experimental class (100%) and the control class (88.89%) exceeds 85% so that it can be said that both the experimental class and the control class have achieved classical completion even though the final grades of the two classes are different.

Data on improving student learning achievements after receiving treatment. Presented in the following table..

Table 4 The Recapitulation of students' N-Gain each classes

Class	N gain	Category
Experimental	0.63	Medium
Control	0.50	Medium

The N-Gain criteria for each individual are divided into 3 categories, namely low, medium, and high categories. The N-Gain criteria for both the experimental class and the control class are in the medium category. Even so, the experimental class obtained a greater number, namely 0.63, while the control class was 0.50. In the experimental class the percentage increase in learning outcomes in the low category was 2.78%, 55.56% medium, and 41.67% high. Whereas in the control class, the percentage increase in learning outcomes in the low category was 13.89%, medium 75% and 11.11% high.

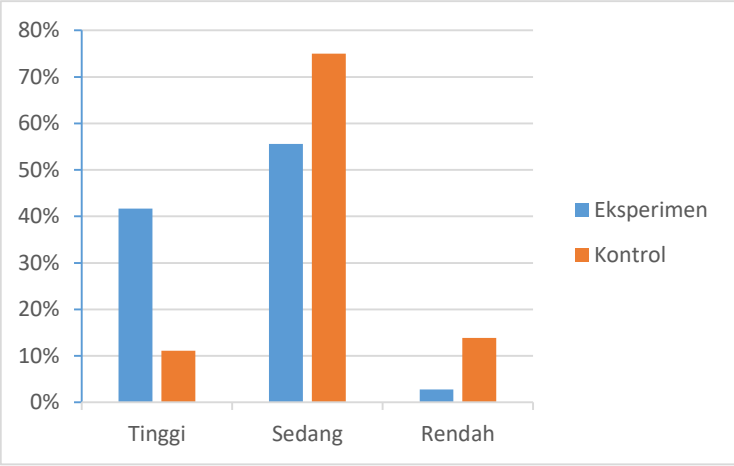

Figure 1 Graph of N Gain each individuals

Student Facilitator and Explaining (SFaE) learning model with a Roundhouse diagram is one variation of the learning model used to increase student activity and learning outcomes. The principle of SFaE learning is that students explain the material to their friends with the help of a previously made

Roundhouse diagram. Roundhouse diagrams help make it easier for students to understand the material being studied. In line with what was conveyed by Safitri (2018) that the Roundhouse diagram is able to train and hone the imagination of students in iconizing the information they have so that it can make it easier for students to remember important things they have read to put into pictures. The assignment to make the Roundhouse diagram in this research was carried out twice with two different subjects, namely the structure of the virus body and the reproduction of viruses which were made individually by each student. The scores obtained from this assignment are then averaged and the results are as many as 81% of students get good to very good results and 19% of students get fairly good results. The data is presented in table 5.

Table 5. The Recapitulation of The Roundhouse Assignment Scores

Category	Amount	Percentage
Not good	0	0%
Good enough	7	19%
Good	19	53%
Very good	10	28%
Total	36	100%

Time limitation causes it not possible for all students to progress, so the teacher appoints students who will move forward to explain the material randomly. That way it is expected that all students can prepare themselves as best as possible to understand the material. Students who are not advanced can take an active role by asking questions and expressing their opinions. Prisani (2017) said that the SFaE model allows students to be active in the learning process so that students can build their ability to ask questions and express their opinions.

Students' Activity

Student activities in this study were assessed when learning activities were in progress, by measuring student activity at each stage of learning. The learning stage in the experimental class is when the teacher provides instructions and presents a general description of the material, when students make Roundhouse diagrams, when students work on group assignments, when the discussion is in progress, when the teacher provides conclusions on the discussion and when the teacher explains the material as a whole. The highest student activity with a total score of 103 was in the last category, namely when the teacher explained the material as a whole, where in this activity the students listened quietly and actively recorded the teacher's explanation. Below is presented the total value data at each stage of student activity in the experimental class

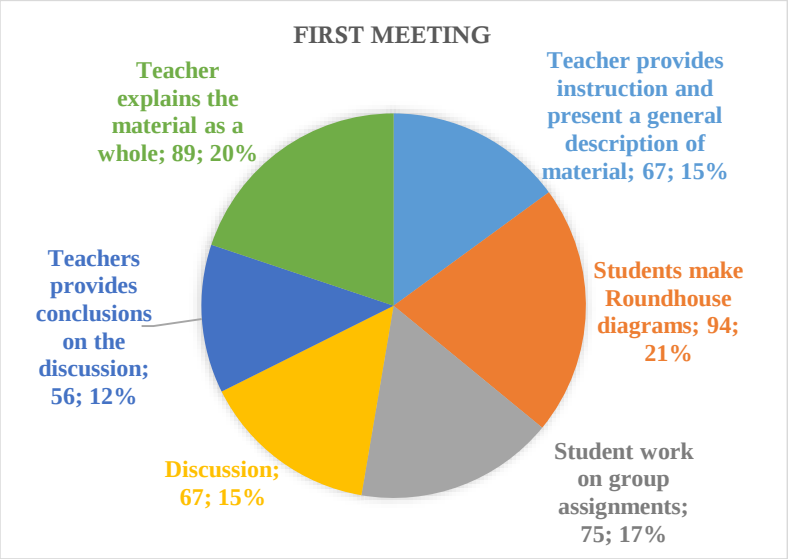

Figure 2 The data of students' activity scores in every learning steps of experimental class in the 1st meeting

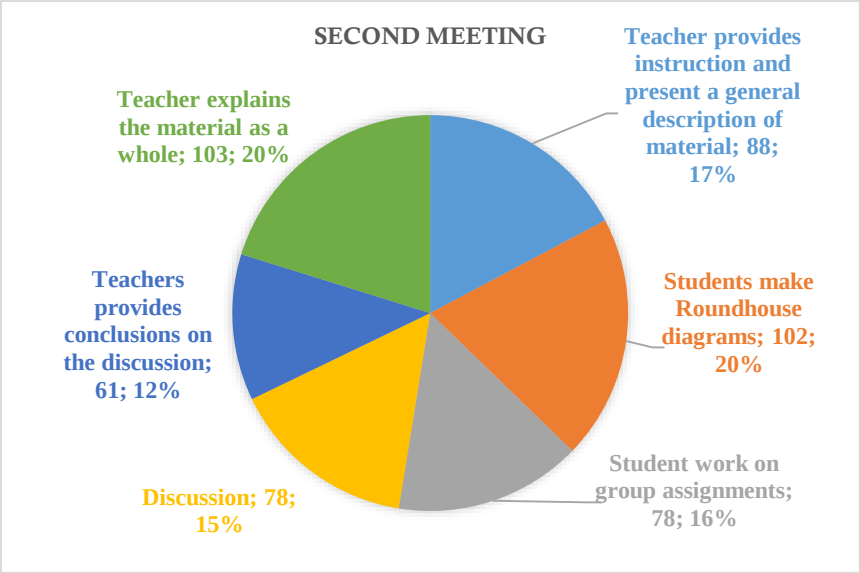

Figure 3 The data of students' activity scores in every learning steps of experimental class in the 2nd meeting

The data presented in Figure 2 and Figure 3 show an increase in student activity at the second meeting. Learning the SFaE model with the assignment of Roundhouse diagrams is able to spur student activity because students are required to be able to explain material to their friends. High activity can affect learning outcomes, as stated by Efendi (2014) that a high level of student activity is one of the factors that influence the success of the learning process, indicated by the achievement of good learning outcomes.

Table 6 The Recapitulation of Students Activities in Experimental Class and Control Class

Category	Experimental Class		Control class	
	Amount	Percentage	Amount	Percentage
Very Active	13	36.11%	10	27.78%
Active	20	55.56%	22	61.11%
Active Enough	3	8.33%	4	11.11%
Less Active	-	-	-	-
Inactive	-	-	-	-

Teachers Response

Biology teachers who teach the experimental class and the control class also provide responses to the implementation of learning carried out by researchers through interviews. In the interview, they stated that SFaE learning with the Roundhouse diagram was able to foster students' enthusiasm for learning and were interested in applying the model to other materials. However, considering that the SFaE learning model with the Roundhouse diagram took a lot of time, they gave suggestions so that the implementation of learning could be prepared as well as possible.

Students Response

Experimental class students also participated in giving their responses related to the learning that had been implemented. Based on the data from the recapitulation results obtained through the student response questionnaire sheet, it was found that 36% of students were very interested, 58% of students were interested, and 6% of students were quite interested in participating in learning using the SFaE model with Roundhouse diagrams. This shows that students feel happy and interested in the SFaE learning model with the Roundhouse diagram on the virus material that has been taught.

CONCLUSION

Based on the results of the data analysis and discussion, it can be concluded that the application of the Student Facilitator and Explaining (SFaE) learning model with Roundhouse diagram is effective in improving students' activity and learning achievement in Virus material.

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