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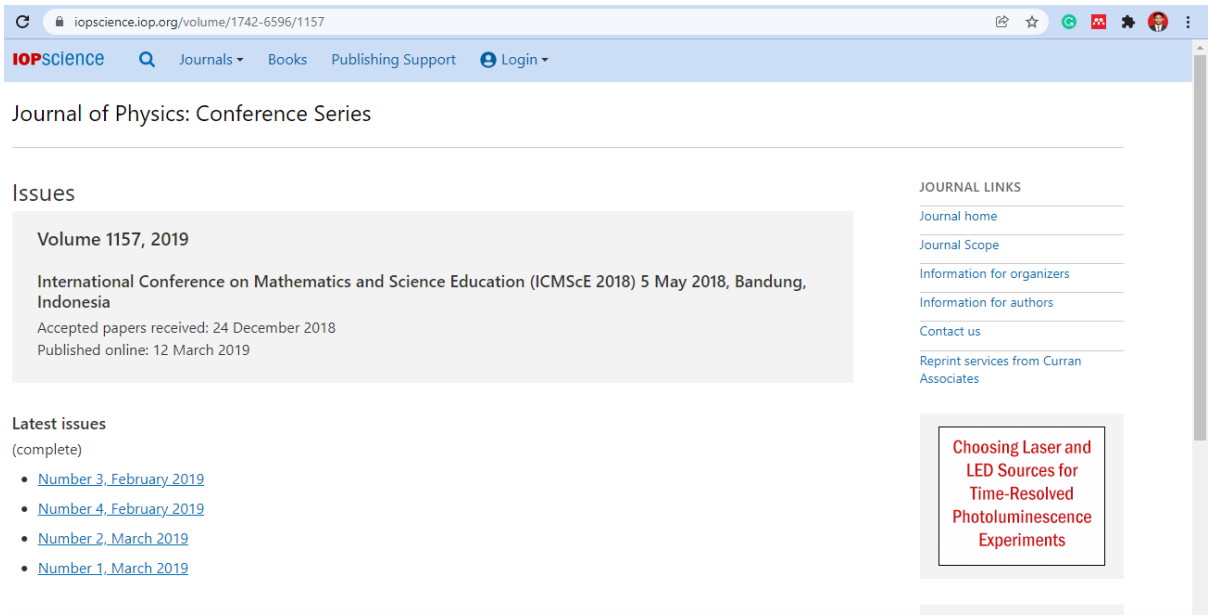

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Table of contents

Volume 1157
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Previous issue Next issue
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Open all abstracts

Issue 3

Papers

JOURNAL LINKS
Journal home
Journal Scope
Information for organizers
Information for authors
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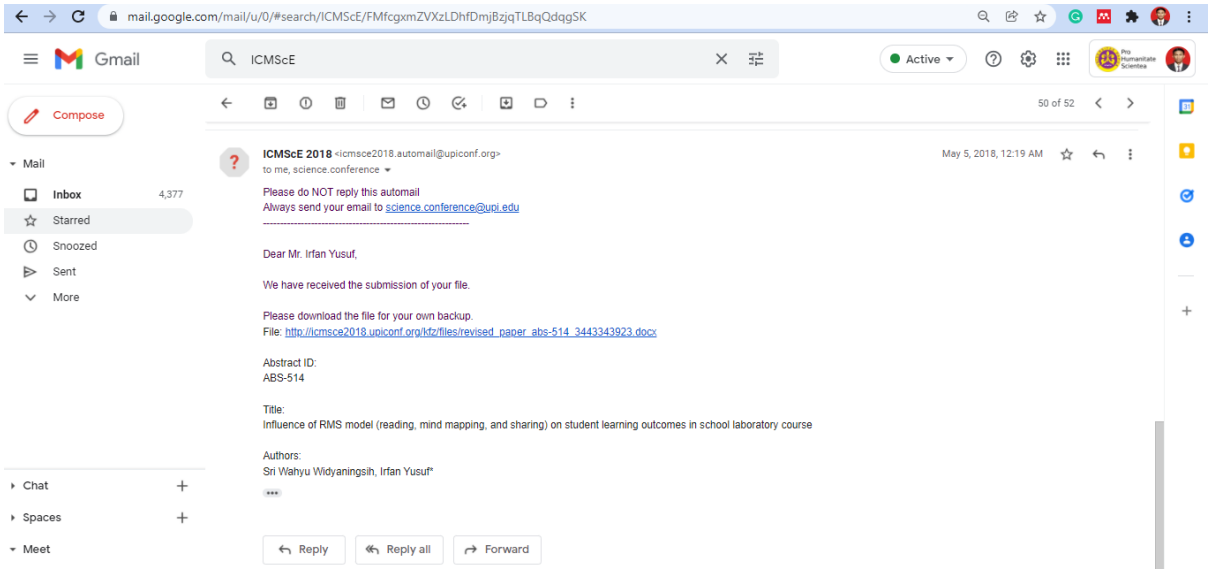

Influence of RMS model (reading, mind mapping, and sharing) on student learning outcomes in school laboratory course

Influence of RMS model (reading, mind mapping, and sharing) on student learning outcomes in school laboratory course

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Abstract. This study aims to determine the effectiveness of the RMS model (reading, mind mapping and sharing) in the school laboratory course on student learning outcomes. This study is quasi-experiment. The sampling technique was done through saturated sampling technique. The population, as well as the sample in this research, were 13 students of semester 2 in Jurusan Pendidikan Fisika Universitas Papua which contract the course of the school laboratory even semester 2017-2018. To measure and know the student learning outcomes conducted tests using multiple choice questions amounted to 50 questions. The result of the analysis showed that there was a significant difference in the average of student learning outcomes before and after learning using the RMS model evidenced by the acquisition of sig. <0.05. The effectiveness of RMS model could be known from the value of effect size is 1.36 which is in the high category. So it can be concluded that physics learning through effectively RMS model applied to student learning outcomes in the school laboratory course.

1. Introduction

Learning in the classroom is all the efforts undertaken by the teacher to create a learning atmosphere for learners. Learning aims to learners can find effective ways to learn, seek information, and find ourself a concept so that in the learning process learners can take advantage of various learning resources including the surrounding environment [1-3]. At this time the source of learning is not only obtained from books available in print, but also in the non-printed form that can be obtained from various online sources. The ability of learners in reading or literacy science to understand the content of materials from various sources of learning are very important and must be developed because it is hoped the learners can find themselves a concept and understand it well. One strategy that can be used to develop the ability of learners in comprehending the subject matter as a whole is to present the material through mind mapping media [4,5].

The combination of reading, mind mapping, and sharing (RMS) is one strategy that can be used in learning. The RMS model can be one of the solutions to develop students' ability, especially for prospective teachers in developing ideas, solving problems, seeking answers, describing, researching, and arguing [6]. The problems faced so far in Jurusan Pendidikan Fisika Universitas Papua is the low ability of students in arguing or put forward their ideas in lectures [7]. The students' ability to articulate ideas illustrates their mastery of lecture material [8]. The low ability to argue is one indication that the

students have not understood the material presented during the lecture. Students can propose an idea if they have understood the material learned [9-11].

Students need to be provided with material understanding and the ability to express their opinions so that they can carry out their professional duties properly, especially for prospective teachers. One of the important courses comprehended comprehensively by physics teacher candidates is a school laboratory material that requires them to facilitate practicum activities for students in school. The learning of the RMS model is one of the right solutions to develop students' ability to examine various sources of reading, to make mind mapping, and to discuss their work during classroom learning. Therefore, learning RMS model is expected to improve student learning outcomes. Based on the problem, the purpose of this research was to know the application of RMS learning in the school laboratory course; measuring student learning outcomes before and after the application of RMS model learning; and analyze student responses during learning.

2. Experimental method

This research is a quasi-experiment with one group pretest-posttest. The sampling technique was done through saturated sampling technique. The population, as well as the sample in this research, were 13 students of semester 2 in Jurusan Pendidikan Fisika Universitas Papua which contract the course of the school laboratory even semester 2017-2018. To measure and know the student learning outcomes conducted tests using multiple choice questions amounted to 50 questions. The measurement of the influence of RMS learning on student learning outcomes was done using SPSS program through parametric technique paired samples test because it obtained normally and homogenous data. The effectiveness of RMS model can be known from the value of effect size as in equation (1).

$$d = \frac{\left(m_A - m_B\right)}{\left(\left(sd_A^2 - sd_B^2\right)/2\right)^{1/2}} \quad (1)$$

Where d is the effect size, m_A is the posttest average value, m_B is the average value of pretest, sd_A is the standard deviation of postest, and sd_B is the standard deviation of pretest [12]. The value of the effect size is then categorized based on the criteria of the size of the effect size as shown in table 1 [13].

Table 1. Effect size category.

Effect Size	**Category**
$d < 0.2$	Small
$0.2 < d < 0.8$	Medium
$d > 0.8$	Large

3. Result and discussion

Learning through the RMS model begins with the assignment of individual students to read the various sources of reading related to the school laboratory material being study. The next stage is the students in groups to discuss to present the results of their study in the form of media mind mapping. The final stage of learning through RMS is sharing. Sharing was done during classroom learning. Each group presented their work in the form of a mind mapping presentation in front of the class. Other groups of students responded and asked questions related to things that were not understood or needed to be clarified. Figure 1 shows the RMS learning atmosphere in the classroom.

Figure 1. Learning situation of RMS model in school laboratory course.

Measurement of student learning outcomes before and after the learning using RMS models obtained N g-value 0.4 or are in the medium category. The result of N-g test shows that learning using RMS model in school laboratory course can improve student's learning outcomes. Learning through the RMS model can improve students' thinking skills in presenting their work through mind mapping [14].

Table 2. The result of the gain test result of student learning before and after learning using RMS model in school laboratory course.

	Pretest	Posttest	g	N-g	N-g Category
Average	54.0	66.0	12.0	0.4	Medium
Standard Deviation	9.4	8.2	8.8	0.9	

Based on normality test results obtained sig. value pretest and posttest of 0.998 and 0.111 greater than 0.05 indicating that the data was normally distributed. Homogeneity test results obtained sig. value 0.769 greater than 0.05 indicating that the data was homogeneous. Based on the prerequisite test results obtained that the data distributed normally and homogeneous so that the test was continued with the parametric test is the type of paired samples test as in table 3.

Table 3. The results of paired samples test to determine differences in student learning outcomes before and after learning.

		Paired Differences					t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest – Posttest	-12.00	8.79394	2.43900	-17.31412	-6.68588	-4.920	12	0.000

Table 3 shows that the mean value is -12.00 or there is a tendency to increase learning outcomes after treatment. The average increase in learning outcomes is 12.00. The sig. value (2-tailed) is 0.000 means there is difference between before and after treatment because p-value <0.05 (95% confidence). Learning by using RMS model can develop students' creativity in reading, making mind mapping, and presenting their work in front of the class.

To know the effectiveness of learning using RMS model on the school laboratory subjects on student learning outcomes then tested the effect size as in table 4. Results calculation effect size obtained the value of 1.36 which indicates that the learning using effectively RMS model used in the school laboratory subjects against student learning outcomes.

Table 4. The result of effect size test to find out how big the effectiveness of learning using RMS model.

Learning Outcomes	Average	Standard Deviation	Effect Size Value	Category
Pretest	54.0	9.4	1.36	Large
Posttest	66.0	8.2		

Based on table 4 it can be seen that the average of pretest and posttest learning outcomes of students has increased from 54.0 ± SD 9.4 to 66.0 ± SD 8.2. The improvement of the learning result shows that the learning done can improve student learning outcomes, although the average value is still in enough category. Student understanding can be developed at every stage of RMS learning. At the reading stage, students are expected to be critical in reading and searching for much information about the material or concept of the material being study. At the stage of mind mapping, students collaborate in making mind mapping. Collaborative learning activities or groups can create collaboration, discussion, exchange ideas or thoughts, and evaluate and seek solutions to problems together [15-17]. The last stage of RMS learning is sharing. At the sharing stage, each group presents their mind mapping in front of the class so that there is a process of interaction and sharing during classroom learning.

Assessment of student response after learning can be illustrated by Rach modeling as shown in figure 2. It is seen that the learning using RMS model was approved by the students. RMS learning can generate a positive response for learners. A positive response to RMS learning has an impact on their better learning outcomes compared to the previous one [18].

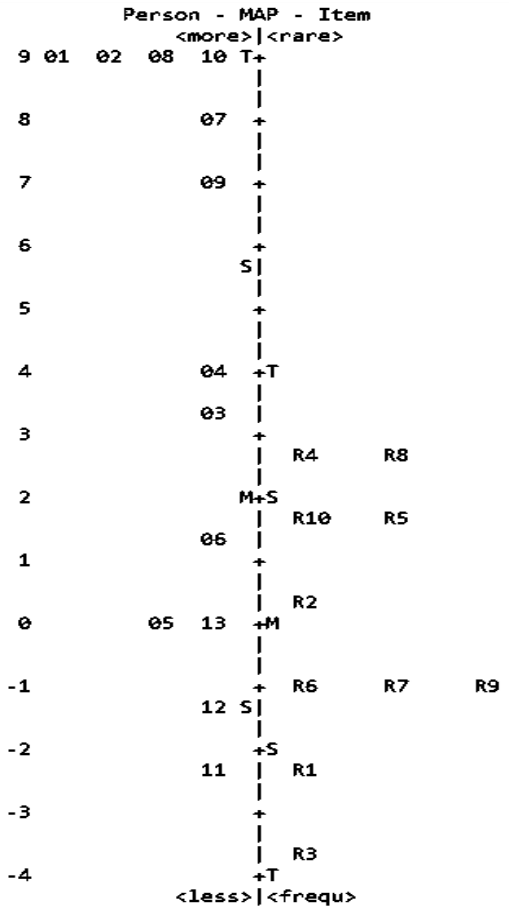

Figure 2. Overview of student response to RMS learning through Rasch modeling.

Based on figure 2 it can be seen that on the left side there are eight people with high ability level or approving all statement items in the given response questionnaire. At the bottom left of the map, there is only one person, is student number 11 with low ability level or low approval level compared to the others. On the right-hand map also shows that the most agreeable statement is the R3 statement about ease of learning through the use of RMS model. The most challenging response questionnaires to be approved are R4 and R8 on self-learning and improved thinking skills. It is because in the reading stage students are assigned independently to learn various sources of reading related to the material being

study, while in the classroom learning that is at the stage of making mind mapping they work in collaboration to complete the task given [6,14]. The implementation of classroom learning more material discussion so that students are required to understand the problems thoroughly.

4. Conclusion

Learning of the RMS model in the school laboratory courses is effectively used to develop student learning outcomes. In general, students responded well to RMS learning.

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