The Implementation of JiRQA Model to Improve Biology Learning Outcomes at Indonesia Junior High School

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Abstract: Biology is a material that requires an understanding of students' learning outcomes. This research aims to determine the effect of the JiRQA learning model on the learning outcomes of class VIII students at Yoseph Khatulistiwa Middle School and Nusantara Indah Sintang Middle School. This research was a quantitative approach with a weak experiment design method. The population was all class VIII students at Yoseph Khatulistiwa Middle School and Nusantara Indah Sintang Middle School, consisting was 29 students, 16 students at Yoseph Khatulistiwa Middle School and 13 students at Nusantara Indah Sintang Middle School. The instrument to measure students' learning outcomes is in the form was 20 multiple choice questions. The data obtained was analyzed using descriptive statistical analysis and inferential analysis in the form of a paired sample t test. The results of descriptive statistical analysis showed an increase in the average pretest and posttest scores was 38.62%. The results of inferential statistical analysis show that the significance value for learning outcomes was 0.000 and is greater than alpha 0.05, so it can be concluded that there is a significant influence of the implementation of the JiRQA learning model on students' learning outcomes in Biology material.

Keywords: JIRQA learning model, learning outcomes, biology learning.

Abstrak: *Biologi merupakan materi yang memerlukan pemahaman terhadap prestasi belajar siswa. Penelitian ini bertujuan untuk mengetahui pengaruh model pembelajaran JiRQA terhadap prestasi belajar siswa kelas VIII di SMP Yoseph Khatulistiwa dan SMP Nusantara Indah Sintang. Penelitian ini merupakan penelitian kuantitatif dengan metode weak eksperimen. Populasi adalah seluruh siswa kelas VIII SMP Yoseph Khatulistiwa dan SMP Nusantara Indah Sintang yang terdiri dari 29 siswa, 16 siswa SMP Yoseph Khatulistiwa dan 13 siswa di SMP Nusantara Indah Sintang. Instrumen untuk mengukur prestasi belajar siswa berupa 20 soal pilihan ganda. Data yang diperoleh dianalisis menggunakan analisis statistik deskriptif dan analisis inferensial berupa Paired sample t test.. Hasil analisis statistik deskriptif menunjukkan adanya peningkatan rata-rata skor pretest dan posttest sebesar 38,62%. Hasil analisis statistik inferensial menunjukkan nilai signifikansi prestasi sebesar 0,000 lebih besar dari alpha 0,05 sehingga dapat disimpulkan bahwa terdapat pengaruh yang signifikan penerapan model pembelajaran JiRQA terhadap prestasi belajar siswa pada materi Biologi.*

Kata kunci: *model pembelajaran JIRQA, prestasi belajar, pembelajaran biologi.*

▪ **INTRODUCTION**

The progress of a nation is determined by the quality of human resources which depends on the quality of education. The quality of education can be maintained in a systematic manner and following clear rules to achieve national education goals. Monalisa & Trapsilasiwi (2015), stated that educational programs that are implemented appropriately will produce human resources of quality and character. Humans of quality and character are humans who have good learning outcomes.

Learning outcomes have a very important role for students to describe knowledge and skills and see changes in student behavior that are obtained after learning. However,

facts on the ground show that students' learning outcomes are still low, especially in biology learning (Tendrita, et al, 2017). Furthermore, research conducted by Winarsih (2015) showed that there were still many students who scored below the KKM, namely 70%. One of the reasons is that the material on human movement systems has a wide range of material and the level of difficulty lies in the number of terms that students must master. According to Apriliya (2016), biology learning initially used a teacher-centered lecture method, which resulted in low student learning outcomes, especially seen from the percentage of incomplete student learning outcomes in the national final exam scores for the 2015/2016 school year of 58.62%. On the other hand, interest in reading also influences students' learning outcomes. This statement is supported by Setiawan (2015) who states that low interest in reading is generally followed by low learning outcomes. Furthermore, Bahri (2016), students' interest in reading is still low so that initial knowledge to participate in the learning process is still very lacking.

According to Bahri (2016), another problem is that students' interest in reading subject matter to prepare themselves for the learning process is still very low, so that students' initial knowledge during the learning process is still lacking. According to Nurmala (2015), students have a habit of coming to school without preparing material, so that in group discussions only a few students actively ask or answer questions. This results in low student activity and learning outcomes. The low cognitive learning outcomes in biology learning are also thought to be due to the fact that there are still many problems related to biology material at the previous school level that have not been resolved. In addition, students' interest in reading learning material to prepare themselves for the next lesson is still very low, so that students' initial knowledge at the time learning progress is still lacking.

The teacher's inability to convey lesson material can also cause students not to understand the material presented. Most teachers deliver material in an observing manner, which makes it boring and causes students to be less interested in the subject matter being presented. On the other hand, learning is often carried out in one direction, meaning that only the teacher speaks during the learning process (teacher centered) and sometimes only interspersed with questions and answers, causing students to obtain unsatisfactory learning outcomes. The impact of this learning process can also be seen on students' cognitive learning outcomes, namely that only some students get grades above average while other students are only below the KKM (Jaya, 2016).

Ordinary questions and answers cannot guarantee students' understanding, because students may only read from notes or other books, causing students to easily forget the lesson material. Lesson material that is only remembered briefly is not understanding but short-term memory. This will certainly have a negative impact on the output produced. On the other hand, the lecture method also influences students' memory. According to Diana (2017), in lecture learning the teacher only activates students' short-term memory and does not motivate students to be active in learning so that students do not understand what has been taught. According to Nurhaeni (2011), lecture methods that are not alternated with other methods can reduce enthusiasm for learning. Furthermore, Djamarah & Zain (2014), learning outcomes using the lecture method are different from learning outcomes using the question and answer and discussion methods. According to Julung (2015), the learning strategies implemented such as lectures, discussions and questions and answers have not been able to accommodate all the characteristics of

students' academic abilities so that the distance between students with high and low academic abilities remains large. The lecture method is also very ineffective if used throughout the lesson for all material with different levels of difficulty (Purwati, 2014).

In an effort to achieve better learning outcomes, students should be directly involved in the learning process or in other words student-centered learning. The student-centered learning model is the cooperative learning model. One of them is the JiRQA type cooperative learning strategy. The JiRQA learning strategy is a cooperative learning strategy resulting from a combination of syntax between the Jigsaw learning strategy and the RQA learning strategy (Bustami, 2017). This learning process is believed to be able to improve students' learning outcomes. The increase in learning outcomes is caused by students being "forced" to read the material to be studied.

The reading process will give rise to a cognitive expansion process through thinking abilities. The JiRQA learning strategy involves students moving directly. Learning by moving directly students will become more enthusiastic about learning. Apart from that, students can also practice their communication skills with fellow students because they will convey the material, they have received previously to their group friends. In JiRQA type learning, students have greater responsibility in implementing learning, not the teacher. Based on several advantages presented above, researchers are interested in using the JiRQA type cooperative model to improve students' learning outcomes in Biology material.

▪ **METHOD**

Research Design

The research method used was a Pre-experimental research method using a one group pretest-posttest design, which compares the pretest and posttest results. Pre-experimental research is the preliminary step to justify the existence of researcher treatment effects. Experimental research aims to prove the effect of the JiRQA learning model on learning outcomes.

Participants

The population is all Nusantara Middle School students and Yosep Khatulistiwa Sintang Middle School students. The sample was class VIII students at SMP Nusantara and SMP Yosep Khatulistiwa Sintang, totaling 29 students consisting of 16 students at SMP Yoseph Khatulistiwa and 13 students at SMP Nusantara Indah Sintang. Sampling in this research was by using a saturated sampling technique. This is because the entire population was taken as a research sample.

Instrument

The research instrument used in this research is a test instrument in the form of 20 multiple choice questions. Test questions are used to measure learning outcomes with cognitive indicators of Bloom's taxonomy revised by Anderson & Khrathwohl (2001), namely remembering, understanding, applying, analyzing, evaluating, and creating. Before use, the instrument has been validated for content, construct and empirical validation. The validation results show that learning outcomes questions are suitable for use as research instruments.

Data Analysis

Data analysis uses descriptive statistical analysis and inferential statistics. Descriptive analysis aims to determine the average value of students' learning outcomes. Inferential analysis uses paired t-test to determine the results of hypothesis testing. Before testing the hypothesis, prerequisite tests are carried out, namely the normality test and homogeneity test. The normality test used the Kolmogorov-Smirnov sample and the homogeneity test used the One Way Anova formula, then continued with the Paired Sample T-test at a significance level of 0.05. All data analysis was assisted with SPSS version 25.

▪ **RESULT AND DISSCUSSION**

Data from learning outcomes research was obtained by giving initial and final learning tests using multiple choice test questions. The test results were analyzed using descriptive statistics and inferential statistics. The results of descriptive analysis were carried out to determine the average pretest and posttest scores. The pretest and posttest were carried out by 16 students in class VIII of SMP Yoseph Khatulistiwa Sintang and 13 students in class VIII of SMP Nusantara Indah Sintang totaling 29. The following are the results of the descriptive analysis of the results of students' learning outcomes which can be seen in Table 1. Based on Table 1, it can be seen that the pretest mean score for learning outcomes is 35.21 with the highest score being 50, the lowest score being 20, while the average posttest score for learning outcomes is 73.83 with the highest score being 82, the lowest score being 67. The average score for students' learning outcomes. experienced an increase of 38.62. This shows that the JiRQA model is able to improve students' learning outcomes in biology learning.

Table 1. Average value of student learning outcomes

Value	Learning outcomes	
	Pretest	**Posttest**
The highest score	50	82
Lowest Value	20	67
Average Value	35.21	73.83
Category	Very less	Good
Enhancement	38.62	

The results of this research are in line with research conducted by Bustami et al (2021), Safitri et al (2018) and Muhlis (2018), Pujiana et al (2016), Amedu (2015), Al-Salkhi (2015), Juweto (2015) revealing that the Jigshaw learning strategy has more influence on cognitive learning outcomes than conventional learning strategies. Furthermore, Haerullah & Usman (2013), Akmalaya & Hapsari (2016), Bahri (2016) and Corebima (2016), also reported that the RQA learning strategy had an effect on cognitive learning outcomes. It can be concluded that the JiRQA learning model can improve students' learning outcomes.

The normality test on students' learning outcomes was obtained from the results of the pre-test and post-test. The results of the normality test show that both the pre-test and post-test results have a probability value (Sig) greater than alpha 0.05. With the normality test results, the pre-test results are Sig $0.115 > 0.05$ and the post-test results are Sig $0.20 > 0.05$. These results provide the conclusion that the research data, both pre-test and

post-test, are normally distributed. Normality test results on learning outcomescan see in Table 2.

Table 2. Normality test results

	Kolmogorov-Smirnov [a]			Shapiro-Wilk			
	Statistics	Df	Sig.	Statistics	df	Sig.	Information
Pretest_Achiev	.146	29	.115	.955	29	.242	Normal
Posttest_Achiev	.112	29	.200 [*]	.928	29	.051	Normal

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Homogeneity test results on learning outcomes student can seen in Table 3. Based on Table 3, sig is obtained. (2-tailed) is greater, namely 0.107 from the alpha value of 0.05. These results prove that the data for each test, both pretest and posttest, are declared homogeneous.

Table 3. Homogeneity test results

Test of Homogeneity of Variances

		Levene Statistics	df1	df2	Sig.
Learning outcomes	Based on Mean	2.679	1	56	.107
	Based on Median	2.456	1	56	.123
	Based on Median and with adjusted df	2.456	1	44.951	.124
	Based on trimmed mean	2.614	1	56	.112

The results of the Paired Sample T-test show that the JiRQA learning model has a significant effect on students' learning outcomes. Data has a Probability value (Sig). smaller than alpha 0.05, namely Sig. 0.000, so it can be concluded that the JiRQA learning model has a significant effect on students' learning outcomes. The results of the Paired Sample T-test can be concluded that the JiRQA learning model has a significant effect on students' learning outcomes in biology learning. A summary of hypothesis testing can be seen in Table 4

Table 4. Hypothesis test results on the influence of the jirqa learning model

Paired Samples Test

		Paired Differences							
				Std. Error Mean	95% Confidence Interval of the Difference				Sig. (2-tailed)
		Mean	Std. Deviation		Lower	Upper	t	df	
Pair 1	Pretest_achiev - Posttest_achiev	-38.621	6.333	1.176	-41.029	-36.212	-32.843	28	.000

The results of the inferential analysis of the influence of the JiRQA learning strategy on learning outcomes show that the Sig (2-tailed) value is 0.000 while the α value = 0.05.

This means that Sig (2-tailed) < α, namely 0.000 < 0.05, so there is a significant effect of using the JiRQA learning strategy on students' learning outcomes. Learning outcomes have increased because the JiRQA learning strategy has advantages in its learning syntax, especially reading activities, making questions and answering questions and with the presence of home groups and expert groups so that the learning process is student-centred, with student-centred learning the students will be more active so that improve students' cognitive learning outcomes.

The results of this research are in line with research by Budiawan (2013) and Hakim (2014), revealing that the Jigsaw learning strategy has more influence on learning outcomes compared to conventional learning methods. Research conducted by Bahri et al (2016) and Bustami (2017), also revealed that the RQA learning strategy can improve cognitive learning outcomes. So, it can be concluded that implementation JiRQA learning strategies are influential significant to learning outcomes student biology. Wicaksono (2016) and Bustami (2017), revealed that the superiority of the JiRQA learning strategy lies in the characteristics of each learning stage which can improve students' cognitive learning outcomes. The results of this research concluded that learning using the JiRQA learning strategy can improve students' cognitive learning outcomes.

Learning strategies JiRQA directs students to make summaries so that students become active and can improve learning outcomes students, because by summarizing, viewing and writing it certainly makes it easier for students to understand and remember the material studied. This research is in line with research conducted by Bahri (2016), which states that the summarizing process includes stages of reading, asking questions and answering questions which can improve students' learning outcomes and concept mastery abilities.

Furthermore, the JiRQA learning strategy has a home group and an expert group which makes students active in discussions and the expert group becomes a tutor for their home group so that students exchange information which will form an understanding of the material being studied. The stages in implementing the JiRQA learning strategy can make students active, creative and dare to appear so that learning is more meaningful and this proves that the application of the JiRQA learning model can improve cognitive learning outcomes. This research is in line with previous research conducted by Monalisa & Trapsilasiwi (2015), Jaya (2016) and Wicaksono (2018) which stated that the application of the Jigsaw model allows students to discuss actively in two stages of discussion, namely the first stage of discussion with the group. experts to solve problems and the second discussion stage, namely discussion in the original group to account for the results of the expert group discussion.

▪ **CONCLUSION**

Based on the results and discussion, it can be concluded that there is an increase in the average value of learning outcomes between the pretest and posttest results. The average pretest score for learning outcomes was 35.21, which was in the very poor category and the average posttest score for learning outcomes was 73.83, which was in the good category. The results of the Paired Sample T-test showed that there was a significant effect of implementing the JiRQA learning model on learning outcomes in biology learning. It can be concluded that the biology learning model is able to empower the learning outcomes of junior high school students. Therefore, teachers can use the

JiRQA learning model as an alternative learning to improve learning outcomes in biology learning.

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