



The Effectiveness of PQ4R Learning Method in Ecosystem Materials To Improve Students' Learning Outcomes and Reading Skills

M.Dzulhikam[✉], Saiful Ridlo, Nur Kusuma Dewi

Universitas Negeri Semarang, Indonesia

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Abstract

This study aims to analyze the effectiveness of the PQ4R learning method on learning outcomes of students' knowledge and reading skills. The design in this study used posttest only control group with 2 classes taking techniques. Class X-1 as a control class and X-2 as an experimental class using the PQ4R learning method. Data analysis techniques used descriptive analysis to determine the completeness of the learning outcomes of the experimental class. Test the improvement of student learning outcomes with N-gain values. Comparative hypothesis testing with paired t-test samples and reading skills with a questionnaire and observation. The results of students' mastery learning showed that only 10 students out of 35 students reached KKM. Tests for improving student learning outcomes indicate a medium category. The comparative hypothesis test shows the asymp.sig value of 0.001, which means that there are differences in the learning outcomes of the control class and the experimental class. And students' reading skills show the distribution of questionnaires that agree and the observation sheets are categorized as good. The conclusion of this study is that the PQ4R learning method is better than the class that does not use the PQ4R learning method on student learning outcomes and reading skills on ecosystem material.

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[✉] Address correspondence:
Campus Unnes Kelud, Semarang, 50237
E-mail.id: dzulhikam21@gmail.com

INTRODUCTION

Class is one place where students learn. Learning is the process of changing attitudes that occur in humans to become a better person. Learning as a process of creating a relationship between something (knowledge) that is already understood and something (knowledge) that is new and an active process in which students build (construct) new knowledge based on the experience or knowledge they already have (Trianto, 2010). Learning activities will be achieved when within students there has been a change of knowledge and changes in behavior (Puspitorini et al., 2014).

This is because teachers have an important role to teach science process skills in the classroom through planning and organizing teaching and learning activities to achieve scientific information (Iswatun et al., 2017). Besides that, teachers in teaching do not use interesting and varied learning methods, so the expected learning goals are not optimal, can be seen in low learning outcomes, so that learning is less effective (Susanti, 2014). The success of the learning process will determine the quality of education (Indriati, 2012).

As a solution to overcome this, the PQ4R learning method (*Preview, Question, Read, Reflect, Recite, Review*) was introduced. In general, the PQ4R learning method aims to assist students in activating themselves in achieving a concept through the activities of planning, monitoring and evaluating the stages of learning that they carry out and using the writing process as a tool to study reading texts.

Related to the title of the above research about the effectiveness of PQ4R learning on ecosystem material which is one of the subjects that is expected to be a way to achieve the mandate of Law Number 23 of 2003 concerning the National Education System in 2013 Ministry of National Education (Kurnia & Suryadarma, 2016). Therefore, based on the above explanation, the researcher needs to conduct research to find out the effectiveness of the PQ4R learning method on ecosystem

material on student learning outcomes and reading skills.

Effectiveness is a state that means the occurrence of an effect or the desired effect in actions that bring results. Effectiveness comes from the effective word which means that it can bring results, efficacy about effort or action (large Indonesian dictionary). So the effectiveness of the purpose in this study is the influence that can produce greater value in learning by achieving learning objectives. The objectives of learning theory include: Knowledge and understanding, excavation and discovery, imagination and creativity, attitude and science, and application (Pamungkas et al., 2017). Classroom learning activities are a key factor in achieving the stated goals (Satrianingsih et al., 2017).

The application of appropriate learning methods will make it easier for students to receive information conveyed by the teacher, so that the learning process can achieve predetermined learning goals (Hazami et al., 2015). PQ4R learning method is one of the instructional learning methods consisting of *Preview, Question, Read, Reflect, Recite, Review* (Trianto, 2010). Every educator is required to be able to design good learning by choosing the right method in accordance with the character of the material (Kusumaningrum & Djukri, 2016). These activities and reading skills cannot be replaced by other teaching methods. To support the learning process, learning resources are needed that can help the learning process of theory and practice (Diba et al., 2017).

Learning outcomes can be stated in the form of learning achievement. Learning achievement is an outcome that can be achieved by students after learning. Student learning achievements are grouped into cognitive, affective, and psychomotor (Istijabatun et al., 2016). There are two kinds of learning processes namely meaningful learning and memorization learning. Science is constructive learning, because it emphasizes the process of assimilation and association of phenomena, so that students' knowledge must

always be updated and constructed continuously (Hayati et al., 2013).

Positive student attitudes, especially to the teacher and the subjects taught are a good initial indication of the learning process. Conversely, a student's negative attitude towards the teacher and the subject being taught can be a barrier to the learning process. This in the end will certainly affect student learning outcomes (Mukti & Nurcahyo, 2017). Science learning does not only focus on improving cognitive development, but also the development of scientific attitudes of students (Habibah et al., 2017).

The measured learning activities include individual student activities and teacher performance. This can be understood because the success of students in learning is determined by their ability to read (Syamsi et al., 2013). This learning activity data is measured through observation while learning takes place (Machin, 2012). This meaningful learning will be felt when the preparation of learning is done by paying attention to the needs and involvement of learners to the fullest (Anisa, 2017).

Ecosystem is the material contained in the 2013 curriculum emphasized using a scientific approach to a scientific approach (Usman et al., 2017) as a biology subject taught in class X semester 2. The theme of curriculum development in 2013 is that it can produce Indonesian people who are productive, creative, innovative, and affective through strengthening attitudes (know why), skills (know how), and integrated knowledge (know what) (Jayawardana & Djukri, 2015). In the 2013 curriculum, the ongoing learning process is expected to provide opportunities for students to develop all their potentials both in terms of attitude (affective), knowledge (cognitive), and skills (psychomotor) (Haryanti et al., 2016; Wina et al., 2017).

METHODS

This type of research is a quantitative study using an experimental design that is quasi-post only village control group control to

test the differences in learning outcomes between students who use PQ4R learning and students who use the discussion method. The population of this study was all students of class X semester II at MAN 4 Cirebon and the sample of this study was class X consisting of class X-1 (control class) and class X-2 (experiment).

The initial data analysis technique of the written test of student learning outcomes was tested using tests of validity, reliability, the level of difficulty of the questions and the ability to distinguish the questions. Then the final data analysis technique with mastery learning outcomes, N-gain test, hypothesis testing using SPSS v.25 and student reading skills using questionnaires and observation sheets.

RESULTS AND DISCUSSION

Based on research tests conducted on the experimental class and the control class obtained posttest student learning outcomes. The completeness analysis of student learning outcomes is carried out to find out whether the average score of students learning outcomes in ecosystem material reaches the minimum completeness criteria (KKM) of 70. There are 10 students whose grades are above the KKM and as many as 25 students whose grades are still below the KKM in the experimental class.

The results of improved student learning were tested using the N-gain test on the pretest-posttest scores of the experimental class and the control class. The results of the N-gain test for improvement in student learning outcomes are presented in Table 1.

Table 1. N-gain Criteria Test Results

N-gain Criteria	Experiment	Control
Low	13	26
Medium	20	9
High	2	-
Average	37.8	23.7

Based on the results of the N-gain analysis, it can be concluded that the increase in

student learning outcomes is included in the medium category based on the N-gain criteria $30 \leq N\text{-gain} \leq 70$.

Post-comparative analysis of student learning outcomes of PQ4R (Experimental class) learning methods with classes that do not use PQ4R (Control class) learning methods on ecosystem materials using the IBM Statistics SPSS 25 program by conducting two-paired sample tests (Paired Samples t Test). The following are the results of the analysis in Table 2.

Table 2. Comparative Test Results

Results	Asymp. Sig. (2-tailed)	Criteria
Experiment classes- control classes	.001	Ho refused

Based on the table above it is known that the significance of the Asymtop or Asymp.Sig value is 0.001. When compared, the value will be less than 0.05 ($0.001 < 0.05$), this means that Ho is rejected and Ha is accepted, which indicates that there are differences in the average value of student learning outcomes in the ecosystem material.

Students' reading skills on the PQ4R learning method (experimental class) on ecosystem material reach the predicate B KKM criteria (good). Questionnaire sheets distributed to experimental class students who use the PQ4R learning method on the ecosystem material get a good attitude, this can be seen from 45.7% of students agree. The results of the observation sheet reading skills of students that of the 35 students recapitulation scores observation sheet students' skills in reading showed a good category.

Learning that involves students actively contributes greatly to the success of learning activities (Wasiso & Hartono, 2013; Syarifah & Sumardi, 2015). This is a concern because science is not only focused on concepts or procedures, but also examines contextual material in everyday life (Armitage et al., 2015; Muhfahroyin, 2009; Mamu, 2014). This is also reinforced by the opinion that learning of

natural science requires optimal student involvement so that learning becomes more meaningful (Suryawati, 2013; Widowati et al., 2013).

Good learning methods will facilitate teachers and have the ability to generate student motivation and can provide positive benefits for both teachers and students (Ariana & Mirabela, 2013; Sutrisno & Suswanto, 2016; Zhao & Hou, 2010). Student-centered learning methods can produce academic learning and are more effective at improving students' problem solving and thinking skills (Arends, 2008; Pratama, 2018). Students are expected to be able to relate the material taught to real-world situations and encourage students to make connections between the knowledge they have and their application in their daily lives (Barros et al., 2013; Varma, 2014).

Implementation of the integration of PQ4R learning methods can improve students' metacognitive skills (Setiawati & Corebima, 2017). Each stage in the PQ4R learning method involves students themselves. The important role of PQ4R learning is that the six steps present a positive role in clarifying and establishing the content of reading texts in students' minds (Qawabeh & Aljazi, 2018). It starts with helping students remember what they read. P stands for preview (reads quickly), Q is a question (asks), and 4R stands for read, reflect, recite, and review (repeat as a whole).

The learning outcomes criterion is a value boundary which is a measure to determine the level of student success with learning outcomes and these criteria are usually based on existing standards or measures (Rahayu & Dewi, 2017). According to (Sarwi et al., 2013), Teachers are expected to be able to adapt and modify learning methods so students are more interested and comfortable in learning subjects. Descriptive analysis, it can be seen that the average pretest score of the experimental class is 3.2 and for the average the mean score of the experimental class posttest was 5.8 while the average pretest value of the control class was 3.7 and for the average posttest value of the control class was 5.2. This

shows that for both the pretest and posttest scores of the experimental class have not yet reached the KKM value of 70, the KKM (Minimum Completeness Criteria) is the benchmark for knowing the success of teaching and learning in the classroom.

The difference in learning outcomes between the control group and the experimental group is quite far because through the PQ4R method makes it easy for students to do the learning process (Linayaningsih, 2011). Students must be able to think critically and communicate effectively (Alismail & McGuire, 2015; Kahlke, 2013; Weissblueth, 2014; Armita & Marsigit, 2016). So the effectiveness of the PQ4R learning method is better than the discussion method which can be seen from the comparison of the N-gain values between the two classes even though between the experimental class and the control class only 10 students have achieved the KKM scores with low criteria.

Based on the results of the hypothesis test it can also be seen that there are differences in student learning outcomes between the classes applying the PQ4R learning method (experimental class) and the class implementing the discussion method (control class). Where based on Test Statistics it is known that the obtained value of Asymp significance or Asymp.Sig is 0.001. if compared then the value will be smaller than 0.05 ($0.001 < 0.05$), this means that H_0 is rejected and H_a is accepted which indicates that there are differences in student effectiveness between classes using the PQ4R learning method (Experimental class) and classes that use discussion method (Control class) on ecosystem material.

The questionnaire given to respondents aims to obtain data on the extent to which the use of PQ4R learning methods to improve student learning outcomes (Anggereni & Khairuradzikin, 2016). So from the 20 questionnaire statements about students' attitudes using the PQ4R learning method can be categorized as strong or good that students like and like. So it can be concluded that the questionnaire distributed to students of the

experimental class using the PQ4R learning method in class X-2 in MAN 4 Cirebon on ecosystem material got a good attitude, this was seen from 45.7% of the students agreed.

Students' reading skills on the PQ4R learning method (experimental class) on ecosystem material are carried out by distributing observation sheets to the experimental class students in class X-2 at MAN 4 Cirebon. The purpose of using this observation sheet is to find out the effect of PQ4R in increasing the level of student attention. Reading skills in the natural science education process must assist students in achieving the goal of developing free, creative, and critical thinking skills (Asrul et al., 2018; Dina et al., 2015; Tasiwan, 2014). Students in reading showed a percentage of 74.28 with a good category.

CONCLUSION

KKM (Minimum Mastery Criteria) is the benchmark to find out the success of the teaching and learning process in class. There are 10 students whose grades are above the KKM and as many as 25 students whose grades are still below the KKM in the experimental class. Based on the results of the N-gain analysis, it can be concluded that the increase in student learning outcomes is included in the moderate category.

Test Statistics obtained Asymp significance or Asymp.Sig value is 0.001. if compared then the value will be smaller than 0.05 ($0.001 < 0.05$), this means that H_0 is rejected and H_a is accepted which indicates that there are differences in the effectiveness of students between classes using the PQ4R learning method. Reading skills of students with questionnaire sheets distributed to experimental class students get a good attitude to agree. While what is done by spreading the observation sheet shows a percentage of 74.28 in the good category.

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