



The Effectiveness of Using PQ4R Based Modules in Improving Critical Thinking Skills in Elementary Schools

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ABSTRACT: The purpose of this study was to determine the effectiveness of the PQ4R-based module to improve students' critical thinking in elementary schools. This study uses a qualitative approach. This research using the One Group Pretest-Posttest Design which is a form of the Pre-Experimental research method. This design uses one group. The population in the study were all students at SD Negeri Berunding. The sampling technique was using purposive sampling and the subjects of this study were students in class IV A at SD Negeri Berunding. Data collection was carried out using observation, interviews and tests. The results of the paired sample t-test were (Sig 0.01 <0.05) which means that there is a difference in the average student learning outcomes between pretest and posttest. The amount of increase using n-gain is 0.513 in the moderate category. Based on the results of the study it can be concluded that learning using PQ4R-based modules is effective for increasing students' critical thinking.

KEYWORDS: Critical Thinking Skills, Module, PQ4R Strategy.

INTRODUCTION

Education is one of the main factors in creating a generation of people who are highly insightful and have good morals (Purmady, 2016). Education is also an important part in developing humans to increase quality resources to support life in the future. To form quality human resources, quality education is also needed. Once the importance of education, it is necessary to improve the quality of education. One of the efforts to achieve this goal is to always look for and find new breakthroughs or innovations in the learning process that have an impact on inculcating the values of the nation's character and culture (Desyandri et al., 2019). The quality of education is often used as a measure of the success of a country's development (Sirate & Ramadhana, 2017). One way to get an education is through school as a formal education route with a structured and academic learning process.

The learning process in schools is structured based on the curriculum. The 2013 curriculum is a form of refinement of the previous curriculum, aiming to prepare the Indonesian generation to have the ability to live as individuals who are faithful, productive, creative, innovative and affective and contribute to the life of society, nation and state (Nizaar et al., 2021). Implementation of the 2013 curriculum is carried out by training process skills which are reflected in learning activities. The 2013 curriculum is a competency-based curriculum which includes competency attitudes, knowledge and skills. To achieve the competencies formulated, thematic learning was chosen as the basis for learning (Fatonah & Yuniyanto, 2021).

Thematic learning as a learning system that allows students both individually and as a group to actively explore, and find concepts and principles in a holistic, meaningful and authentic way (Narti et al., 2016). Thematic learning is the unity of a theme that contains teaching ideas and integrates them into several topics (Apriliani & Radia, 2020). Thematic learning is a learning concept that involves several subjects to provide meaningful experiences to students (Setiawan et al., 2019). Thematic learning really demands the creativity of educators in choosing and developing learning themes (Fatonah & Yuniyanto, 2021). Thematic learning in the 2013 curriculum expects educators to be able to teach or show how science develops in learning such as using innovative teaching materials. The 2013 curriculum requires a teacher to be more creative to improve the quality of learning processes and emphasize higher-order thinking activities (Pratiwi et al., 2020).

Effective learning for elementary school students is not enough just to provide information. This is because elementary school students get bored easily (Dessiane & Hardjono, 2020). Learning media is needed that students like to support learning (Fatonah & Yuniyanto, 2021). Sudjana and Rivai (Surahman & Mukminan, 2017). Learning media is a component of teaching which is very influential on the learning process. The purpose of using media is to help facilitate students' understanding (Ratnasari & Zubaidah, 2017). Media can facilitate educators in the learning process and students will be more interested in following the learning process



(Apriliyani & Radia, 2020). Therefore, teachers need to have the ability to utilize learning media so that the goals of learning can be achieved effectively (Mapiliando et al., 2021).

Preliminary research was conducted by interviewing and distributing questionnaires. The preliminary study was conducted at 3 Public Elementary Schools in the Raden Intan cluster, Ketapang District, namely SD N Berunding, SD N 2 Taman Sari and SD N Sidomukti. Based on the needs analysis data of 3 educators, it is known that the school uses the 2013 curriculum. In thematic learning, educators use theme books and worksheets. The approaches/strategies used by educators in learning are lectures, assignments, questions and answers, adjusting to the material. The implementation of teacher learning experiences difficulties due to the condition of students who are less active in learning, so teachers are active in learning, so learning uses the lecture method. If given the opportunity to ask students rarely respond to ask. Students' critical thinking skills are also low because they have not been facilitated by teaching materials that are in accordance with critical thinking indicators.

The results of the observation of the completeness of learning outcomes in three schools with the subject of 59 class IV students showed that 17 students (27%) completed, and 42 students (73%) did not complete. This shows that the learning outcomes of students are classified as low. The results of the needs analysis in the form of a critical thinking test with the subject of 59 students in grade IV showed that 5 students (8%) were categorized as very good, 8 students (14%) were in the good category, 12 students (20%) were in the sufficient category, 27 students (46%) in the less category, and 7 students (12%) in the very poor category in achieving critical thinking success indicators.

Overcoming these problems, the right solution is to do learning using teaching materials that can improve learning outcomes and students' critical thinking skills. These teaching materials are teaching materials that can be used either at home or at school. In an education system that applies the concept of independent learning, it is necessary to have learning materials specifically designed to be studied by students independently, because it requires professionals who are able to develop independent learning materials (Setiyadi & Gani, 2017).

Teaching materials are part of the learning resources. Teaching materials play an important role in helping students achieve learning goals (Purmady, 2016). Teaching materials as a set of subject matter that refers to the curriculum used in order to achieve competence (Wati et al., 2021). Teaching materials are an important aspect of successful learning. The use of teaching materials in the form of modules in learning in elementary schools can be an option. The use of accompanying teaching materials that have the potential to encourage students to be active in learning is one of the modules (Pratiwi et al., 2020). Effective teaching materials for students are teaching materials that contain material in accordance with core competencies and basic competencies, and in accordance with the development of students (Fitriyanti et al., 2021). Teaching materials that can help the learning process in class and at home are learning modules. The module is a teaching material that is written sequentially using language that is easy for students to understand according to the level of knowledge and age of the students, so that students can learn independently (Nizaar et al., 2021). The use of modules is able to become a link between educators and students to achieve learning objectives and train students' critical thinking skills.

Critical thinking skills are one of the important skills that must be mastered by students to overcome various problems found in daily life activities. According to Facione in Basri (2019) Critical thinking is the ability to absorb and filter existing phenomena. Some experts give different opinions regarding the components in measuring critical thinking skills. Facione in Basri (2019) states that there are six components of critical thinking skills, namely Interpretation, Analysis, Evaluation, Inference, Explanation, and Self-Regulation. One of the reasons why students' critical thinking skills have not emerged in learning activities is the use of teaching materials that have not provided a stimulus for the emergence of these critical thinking skills.

Critical thinking or *critical thinking* is one of the 21st century skills that must be mastered by students. Ennis in Basri (2019) States that critical thinking is reasonable reflective thinking that focuses on deciding what to believe or do. Critical thinking is a cognitive ability that really needs to be developed (Azizah, et al., 2018), because the ability to think critically includes various abilities, namely, the ability to listen, read carefully, find and determine assumptions, present arguments and convince an action based on a good knowledge (Hadinugrahaningsih, et al., 2017). Critical thinking is a skill needed for success in any period of life (Biber, et al., 2013).

Critical thinking is a directed and clear process used in mental activities such as solving problems, making decisions, persuading, analyzing assumptions and conducting scientific research (Septikasari, 2018). Critical thinking is the ability to think logically, reflectively, systematically and productively which is applied in making good judgments and decisions (Hidayah, et al.,



2017). Critical thinking skills are important to have. Critical thinking skills are needed so that a person can solve various problems in his life well. So, critical thinking skills need to be familiarized and improved in the learning process in the classroom (Biber et al., 2013).

Increasing critical thinking must be supported by the use of teaching materials in the form of learning modules. Module packaging aside from being attractive, practical and innovative, the contents of the module must also be considered. One of the efforts that can be done and can improve students' critical thinking skills by using the PQ4R strategy (Preview, Question, Read, Reflect, Recite, Review). The PQ4R strategy is one strategy that can improve memory performance in understanding lessons (Gardenia, et al., 2019), and can help students recall what they have read (Wahyuningsih & Kiswaga, 2019). This strategy is easy to apply at all levels of education and is able to help students improve their questioning skills and communicate their knowledge (Setiawati & Corebima, 2018). Primadani (2020) states that the PQ4R strategy consists of Preview, Question, Read, Reflect, Recite, Review.

One alternative that can be used by educators to improve students' critical thinking skills is by using a PQ4R strategy-based module. This is supported by research Ikashaum & Noer (2020) the results of his research show that the integration of the PQ4R strategy has the opportunity to improve students' critical thinking skills. Other previous research from Gardenia et al., (2019), results research shows that the PQ4R strategy has a positive effect and makes a good contribution to students' mathematical communication skills. Fitriani & Suhardi, (2019) also conducted research with the results showing that the application of the PQ4R learning model can improve students' reading comprehension skills.

In this study, the researcher chose to implement the PQ4R-based module which had been developed in class IV thematic learning theme 8 "The Area where I live" sub-theme 1 "The Environment where I live". The reason is that the material in the theme is material that is very close to the daily lives of students, but the phenomenon is quite difficult to explain and understand for students. This research is expected to be a solution for educators to be able to provide learning innovations and for students to improve critical thinking. Based on the discussion above, it is important to do research with the title "Effectiveness of Using PQ4R-Based Modules in Improving Critical Thinking Skills in Elementary Schools".

RESEARCH METHODS

This study uses a qualitative approach. This research using the One Group Pretest-Posttest Design which is a form of the Pre-Experimental research method. This design uses one group (Mutmainah et al., 2021). This research was conducted at SD Negeri Berunding, Ketapang District. The population in the study were all students at SD Negeri Berunding. The sampling technique was using purposive sampling and the subjects of this study were students in class IV A at SD Negeri Berunding. The reason for taking samples in this class is because the value of the thematic learning outcomes of class IV A is lower compared to other classes.

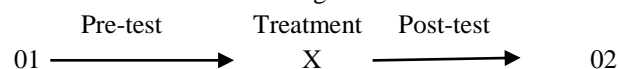


Figure I. Research Design

Data collection was carried out using observation, interviews and tests. Data collection techniques by observation and interviews were carried out to obtain information about existing problems in the field and to analyze needs. In addition, at this stage it is known that the value of student learning outcomes and the test scores of critical thinking skills. Tests are used to obtain data on student learning outcomes. The tests were carried out twice, namely the pretest was carried out before students learned to use the PQ4R-based module, and the posttest was carried out after receiving treatment (Ramadhani & Amudi, 2020). The test instrument is in the form of 10 essay questions.

Data that is suitable for use in research is data that is normally distributed and homogeneous. The normality test in this study was carried out using the SPSS program through the One-Sample test *Shapiro-Wilk*. The results of the analysis are in the form of a probability value (p-value) in the form of Asymp. Sig (2-tailed). The data is said to be normally distributed if the significance (α) > 0.05. The homogeneity test in this study used the One-Way Anova test with the help of the SPSS program. The variance of the variable is the same if the significance (sig) > of the specified alpha level is 0.05.

Analysis of increasing critical thinking uses t-test and n-gain tests to see the effectiveness of PQ4R-based modules. Calculation of the t-test is done by making a decision based on the criteria if (sig) > 0.05, then H_0 is accepted, if (sig) < 0.05, then H_0 is



rejected. The effectiveness test was carried out using SPSS 16.0. The T-test is used to calculate whether the increase in learning outcomes is significant or not (Mutmainah et al., 2021). N-gain is used to calculate the increase in critical thinking. The formula used to analyze n-gain is as follows:

$$N\text{-gain} = \frac{\text{Skor Posttest} - \text{Skor Pretest}}{\text{Skor Ideal} - \text{Skor Pretest}}$$

The category of gain score can be determined based on n-gain in the form of %, while the distribution of n-gain acquisition categories can be seen in Table 3, as follows:

Table I. Criteria for N-gain

N-gain Improvement Criteria	Normalized Score
g-High	$g \geq 0.7$
g-Medium	$0.7 > g \geq 0.3$
g-Low	$g < 0.3$

(Nizaar et al., 2021)

RESULTS AND DISCUSSION

Effectiveness is the impact arising from an action (Mutmainah et al., 2021). In this study, the impact of using PQ4R-based modules on the critical thinking skills of fourth grade students at SD Negeri Berunding. The module used in this study is a module developed with material that has been adapted to the 2013 elementary school curriculum. Research was conducted on thematic learning by combining several subject matter into one lesson. Data to see the effectiveness of using PQ4R-based modules is seen through the scores of pre-test, post-test and completeness of learning outcomes. the thematic minimum completeness criteria (KKM) for class IV is 75. The prerequisite test is carried out by the normality test and homogeneity test, presented in the following table:

Table II. Normality Test Results

Class	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Pretest	.152	28	.095	.942	28	.128
Posttest	.133	28	.200*	.935	28	.080

Based on the table above, it is known that the normality test uses the One-Sample Shapiro-Wilk. Asymp analysis results. Sig (2-tailed) pretest is 0.128 and posttest is 0.080. Significance value (α) > 0.05, then the data is stated to be normally distributed.

Table III. Homogeneity Test Results

	Levene Statistics	df1	df2	Sig.
Based on Means	.359	1	53	.552
Based on Median	.441	1	53	.510

Based on the table above, it is known that the homogeneity test in this study used the One-Way Anova test with the help of the SPSS program. Significance results (sig) obtained $0.552 > 0.05$, then the data is declared homogeneous. Furthermore, the difference in average student learning outcomes at the pretest and posttest using the t-test, this is used to see the effectiveness of the PQ4R-based module, is presented in the following table:



Table IV. T-Test Test Results

	Paired Differences		std. Error	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
	Means	std. Deviation		Lower	Upper			
pretest	-25,464	7,993	1,511	-28,564	-22,365	-16,858	27	001
posttest								

The statistical test results in the table above show that the PQ4R-based module improves the critical thinking skills of elementary school students (Sig 0.00 <0.05), which means that there is a difference in the average student learning outcomes between pretest and posttest. The results of the paired sample t-test followed by the n-gain test stated that the PQ4R-based module was effective in increasing students' critical thinking skills during learning, the magnitude of the increase was 0.513 in the medium category. The results of students' critical thinking skills can be seen in the following table:

Table V. Big Increase in Pre-Test, Post-Test and N-gain

Average value		Big Improvement	N-Gain	The highest score		Lowest Value	
Pretest	Posttest			Pretest	Posttest	Pretest	Posttest
55,39	75.85	20,46	0.513	71	84	36	62

Based on the table above, it shows that thematic learning uses PQ4R-based modules with an average score of students before using the module is 55.39 and after using picture story books is 75.85. From the results of the acquisition of pretest and posttest scores, students experienced an increase. Based on the n-gain analysis of students' critical thinking skills, it shows a value of 0.513 in the medium category. This means that learning using PQ4R-based modules can improve students' critical thinking skills.

The results of students' critical thinking skills are used to determine the effectiveness of using PQ4R-based modules in thematic learning. Assessment of critical thinking skills in students aims to determine whether learning activities have been running effectively, the effectiveness of students can be seen in the ability of students to achieve the learning objectives that have been set. The results of increasing critical thinking skills through PQ4R-based modules are also supported by previous research by Wahyuningsih & Kiswaga (2019), also strengthened by the results of research conducted by Primadani, et al., (2020), that the PQ4R strategy is effective in improving learning outcomes.

Critical thinking indicators used in research are Interpretation, Analysis, Evaluation, Inference, and Explanation. The increase in the pretest posttest value for each indicator is calculated using the n-gain formula. The evaluation indicator obtained the highest gain value, namely 0.571. The results obtained are greater than other indicators of critical thinking. This happens because in the implementation of learning students are trained to observe the discourse in the module.

The gain value on the Explanation indicator is 0.570. The next indicator is interpretation with a gain value of 0.532. This increase shows that students have been able to provide simple explanations of the problems in the questions posed. Another indicator is Analysis with the acquisition of a gain value of 0.518 with moderate criteria. The next indicator, namely inference, obtains a gain value of 0.423 with moderate criteria. In line with research Basri, et al., (2019) on the Inference indicator students can provide conclusions with logical reasons. This is supported by research Birgili (2015) who conducted research to determine the effect of PBL on critical and creative thinking skills. In line with research Gardenia, et al., (2019) that there is an increase in the scores obtained by students when working on the pretest and posttest, and there is an average difference between the experimental class and the control class.

The increase in critical thinking skills in the posttest is higher than the pretest because the syntax in the PQ4R strategy trains students to think critically. The PQ4R-based module makes students more critical in answering questions. They rely more on their thinking abilities, as a result students become more active in seeking and finding answers from various information to solve predetermined problems without relying on educators as a source of information, so that the information obtained makes students



gain new insights about the material. This is supported by research Setiawati & Corebima (2018) that the PQ4R-TPS learning strategy is significantly more potential in empowering students' metacognitive abilities compared to other learning.

CONCLUSION

Based on the research conducted, it is known that there is an average difference between the pretest and posttest which is analyzed using the paired sample t-test, the results obtained are (Sig 0.01 < 0.05) which means there is a difference in the average learning outcomes of students between pretest and posttest. The amount of increase obtained from pre-test to post-test using n-gain is 0.513 in the moderate category. It can be concluded that learning using PQ4R-based modules is effective for increasing students' critical thinking.

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