

The Influence of Class VII Science Subject Teaching Materials in Improving Critical Thinking

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ABSTRACT

This educational process does not only focus on knowledge transfer; it also develops a wide range of individual potential, including academic abilities, relationships, talents, aptitudes, physical abilities, and the arts. Progressivism education is essential to the understanding and implementation of true education in Indonesia. Progressivism education educates students to face and solve problems in social life. This shows how important education is to produce people who are beneficial to society and the country (Sulkify, 2020). This research uses a quantitative approach and is classified as quantitative descriptive research. This research method is conducted by collecting numerical data. This process of collecting and analyzing data is known as research design or research design. This indicates that the research includes planning and conducting it. The design starts with observing and evaluating known research until further evidence is needed. In the research design, a pre-test and post-test control group was used. This test is done with pearson correlation or by comparing r count with r table. Data validity can be seen if $r_{count} > r_{table}$ with 5%. If $r_{table} < r_{count}$ then it is said to be valid. The results of the T table test show that the t count obtained is 14.450 has a significance value of 0.000, which indicates that the seventh grade science subject matter has a significant effect on improving students' critical thinking skills. Based on the results of hypothesis testing, F table obtained 208.806 or greater than F table (208.806 greater than 4.351).

Keyword: Critical Thinking Improvement, Quantitative, Science Subject



INTRODUCTION

Education is a systematic and conscious effort to create a learning environment in which students can actively develop spiritual strength, self-control, personality, intelligence, noble morals, and skills necessary for themselves, society, nation, and state. This educational process does not only focus on knowledge transfer; it also develops a wide range of individual potential, including academic abilities, relationships, gifts, talents, physical abilities, and arts. Progressivist education is very important for the understanding and implementation of true education in Indonesia. Progressivism education educates students to face and solve problems in social life. This shows how important education is to produce people who are beneficial to society and the country (Sulkify, 2020).

Education has an important role in improving a nation's human resources (HR) because good education will produce quality human resources, who are able to face life's challenges and adapt proactively to changing times. Education is a conscious and planned effort to create a learning environment where students can actively develop their potential, including spiritual strength, self-control, personality, intelligence, and emotional intelligence (Wepo, 2023).

Education is very important to improve a nation's human resources. Good human resources are able to face life's challenges and adapt proactively to changing times. Education is a systematic and conscious effort to create a learning environment in which students can actively develop spiritual strength, self-control, personality, intelligence, noble morals, and skills necessary for themselves, society, nation, and state. Education also plays an important role in increasing students' knowledge by increasing their understanding of the material taught. To achieve national education goals, other supporting factors are needed, such as teacher quality, teacher teaching methods, teacher teaching discipline, student learning discipline, textbooks, and preparation of lesson materials which are prepared in accordance with the current curriculum (Putri, 2020).

So, teaching materials are very important to help students think critically. It not only helps students understand what they are learning, but also helps enhance the values inherent in educational learning. Teaching materials play a role in teacher and student learning activities. Student learning outcomes are indicators of a successful learning process, which show the relationship between critical thinking and student learning outcomes. This shows that critical thinking influences student learning outcomes. Student learning outcomes will be positively correlated with students' level of critical thinking.

The learning resources provided by teachers to students are one component of the learning relationship that influences students' low abilities. Therefore, a creative approach is needed to improve and enhance the quality of science learning by improving the learning process by focusing on students' critical thinking abilities. This is important because students' critical thinking abilities have a significant impact on their learning outcomes, and developing teaching materials that encourage students' critical thinking abilities is an important part of improving educational quality and outcomes (Dores et al., 2020).

METHODS

This research uses a quantitative approach and is classified as quantitative descriptive research. This research method is carried out by collecting numerical data. This process of collecting and analyzing data is known as research design or research design. This shows that this research includes planning and carrying it out. The design begins by observing and evaluating known research until further evidence is needed. In the research design, pre-test and post-test control groups were used. Homogeneous groups, consisting of two groups, are the subject of this research. In research, data collection techniques use questionnaires and observation, as well as documentation. Facts are collected through documentation or physical evidence. After descriptive analysis, the data results are presented in the form of frequency distributions and graphs. Next, calculations are carried out to test the hypothesis. The data analysis method used in this research is inferential statistics.

RESULTS

1. Reliability Testing Results

Variables	Cronbach alpha coefficient	The r table value $\alpha = 0.05$ n 20	Conclusion
The influence of science teaching materials	902	0.444	Reliable

2. Reliability testing results

Variables	Cronbach alpha coefficient	The r table value $\alpha = 0.05$ n 20	Conclusion
Think critically	903	0.444	Reliable

3. Results of homogeneity of variance

Variables	Degrees of freedom	Significant value	Error rate 5% ($\alpha = 0.05$)	Homogeneity question if the sig value $> \alpha$
X	2,959	0.94	0.05	Homogeneous

4. T test results

Variables	Unstandardized coefficients	Standard coefficients	Sig.
The influence of science teaching materials	1,417	0.959	0,000



5. F test results

Variables	Sum of squares	F	Sig.
Regression	3095,918	208,806	0,000
Residual	266,882	14,827	
Total	3362,800		

DISCUSSION

The aim of this research is to find out whether the teaching materials for science subjects in class VII have an impact on students' ability to think critically. To achieve this goal, research was conducted using previously created questionnaires and questionnaires to measure how well students could solve the questions given.

Before carrying out the test, the research site first carried out validation at SMPN. The results show that all indicator items are valid and have positive value because $r_{count} > r_{table}$ (> 0.444). Class VII Science Teaching Material variables and variables to improve critical thinking have been used on 20 students who answered questionnaires or 17 senior questions.

After the validation test, a reliability test is then carried out in order to determine the extent to which the measurement results remain consistent. The results of the reliability test show that the correlation between variable scores on the influence of teaching materials for class VII (X) science subjects, the value of the Cronbach alpha coefficient is 0.902 and $n = 20$ r_{table} 0.444 for a significant level of $\alpha = 5\%$, meaning that the variable r_{count} is $0.902 > r_{table}$ 0.444, so the questionnaire as a measuring tool in this research has met the reliability requirements, then the results of the reliability test on the student critical thinking variable (Y), the value of the Cronbach alpha coefficient is 0.903 and $n = 20$ r_{table} 0.444 for a significant level of $\alpha = 5\%$, meaning the variable r_{count} is $.903 > r_{table}$ 0.444, so the questionnaire as a measurement tool in this research has met the reliability requirements, so it can be used as a measuring tool in subsequent analysis.

Based on the data test results above, we will discuss the results of the classical assumption test, which consists of normality, homogeneity and hypothesis tests, as follows. The influence of teaching materials for class VII science subjects on improving students' independent critical thinking abilities. According to the results of the t test, variables have a significant influence on the dependent variable if the significance level is greater or greater than 5% (0.05). The results of the t test (partial) calculation show that the t_{count} value is 14,450 with a significance value of $0.00 < 0.05$ and the t_{table} value is 1.72472, which shows that the t_{count} value is greater than t_{table} . Therefore, H_a is accepted while H_o is rejected. Thus, it can be concluded that the teaching materials for class VII science subjects partially have a significant influence on students' level of critical thinking.

Apart from that, the F test results show that the F_{count} obtained is 208,806 or greater than F_{table} , namely 208,806 is greater than 4.351. The sign value is 0.000. Thus, it can be concluded that there are many independent variables that have a significant influence on the influence of science lesson material in class VII on students' ability to think critically. This shows that the independent and dependent variables influence each other, and that this research has both positive and negative effects.

CONCLUSIONS

The purpose of this research is to test the data using the SPSS application program to determine the effect of teaching materials for class VII science teachers' books in improving students' critical thinking abilities. From the discussion above and the results of this research, it can be concluded that the questionnaire used in this research is considered valid if the significance level is less than 0.05 or greater than the table.

Thus, it can be concluded that the respondents in the research were based on the results of hypothesis testing. The results of the Ttable Tcount test show that the tcount obtained of 14,450 has a significance value of 0.00, which shows that class VII science lesson material has a significant influence on improving students' critical thinking abilities. Based on the results of the hypothesis test, the F table is 208.806 or greater than the F table (208.806 is greater than 4.351).

REFERENCES

- Dores, O., Cahyadi, D., & Susanti, S. (2020). Analysis of Students' Critical Thinking Abilities in Mathematics Subjects. <https://media.neliti.com/media/publications/437574-none-d6ef5bac.pdf>
- Fauzih, U. 2015. Research Design for the Development of Integrated Science Teaching Materials with Light and Color Themes for Middle School Science Learning. Journal: National Innovation and Science Learning, Bandung, Indonesia, (574)
- Khotimah, K, et al. 2016. The Influence of Critical Thinking Abilities and Responses to Multirepresentational Teaching Materials on Learning Outcomes. Lampung University Fkip, (1).
- Lestari, B, P, et al. 2019. The Influence of Inquiry-Based Microbiology Teaching Materials on the Critical Thinking Ability of Students at IKIP Budi Utomo Malang. Journal of Biology and Applied Education, 4(1), 22-28.
- Lieung, W, K. 2019. The Influence of the Discovery Learning Model on Elementary School Students' Critical Thinking Skills. Journal of Primary Education, Faculty of Teacher Training and Education, Masamus University
- Nordin, B. A, 2013. Curriculum Towards Earning Critical, Creative and Innovative Thinking Skills. Juku: Asia Pacific Journal of Curriculum & Teaching, 10-15.
- Nuryanti, L, et al. 2017. Analysis of Critical Thinking Abilities of Middle School Students. Journal of Education: Research and Development Theory, 3(2)155-158.. Purnomo Heru, et al., 2016. Development of Teaching Materials and Science Assessment Instruments with the theme The Beauty of My Country. Completion of 2013 Curriculum Teacher and Student Books. Prima Edukasia Journal, 4(1) .
- Prasetyono N, R, et al 2018. The Influence of Science Learning Based on the Four Pillars of Education on Critical Thinking Ability. Jipva (Veteran Science Education Journal).
- Putri, SA (2020). Improving Student Learning Outcomes. Gurubinar.id. https://gurubinar.id/blog/meningkatkan-hasil-belajar-peserta-didik?blog_id=104



- Rohmatin, N,O. 2012. Critical Thinking Profile of Middle School Students in Solving Geometry Problems Seen from IQ Level. Mathematics Education Study Program, Darul'Ulum Jombang Islamic Boarding School University, Gamatika Vol III.
- Seoyono, Y. 2014. Development of Mathematics Teaching Materials Using an Open-ended Approach to Improve High School Students' Critical and Creative Thinking Abilities. Journal of Mathematics Education, 9(2), 205-218.
- Sugiyono, Quantitative Qualitative Research Methods and R&D. Alfabeta Publishing, Bandung.
- Susilowati, S, 2017. Development of science teaching materials integrated with Islamic values to improve science learning outcomes. Journal of Science Education Innovation, 3(1), 78-88.
- Sulkify. (2020, October 12). Educational Psychology Concept. Dosen.ung.ac.id.<https://dosen.ung.ac.id/Sulkify/home/2020/10/12/kompak-psikologi-pendidikan.html>
- Susilawati, et al. 2014. Development of Physics Teaching Materials Containing Lifeskills for High School Students. Indonesian physics journal, (54)
- Wahyuni, S, 2015. Development of Science Teaching Materials to Improve Junior High School Students' Critical Thinking Abilities. Journal of Physics Education, Faculty of Teacher Training and Education, Jember University, 5(2), 20896158.
- Wepo. (2023, March 30). The Role of Education in Improving the Quality of Human Resources and the Economy - Sharia Economics. Sharia Economics Study Program.<https://an-nur.ac.id/esy/peran-pendidikan-dalam-meningkatkan-kualitas-source-daya-human-dan-Ekonomi.html>
- Zakaria, 2020. Integrating Critical and Creative Thinking Skills in Indonesian Language Learning in Elementary Schools. Madrasah Ibtidaiyah Teacher Education Study Program (PGMI), Tangerang.
- Zulhelmi, et al, 2017. The Influence of Interactive Learning Media on Improving Students' Critical Thinking Skills. Indonesian Journal of Science Education, 5(1), 72-80.