



# Canva-Based E-Modules And Test Forms For Enchancing Critical Thinking Abilities In Class VIII Students

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## ABSTRAK

*Kemampuan berpikir kritis matematis peserta didik masih tergolong rendah karena dalam proses pembelajaran mereka masih mengalami kesulitan dalam menyelesaikan permasalahan matematis yang diberikan, terutama yang membutuhkan kemampuan menganalisis dan memecahkan masalah. Tujuan dari penelitian ini adalah untuk menganalisis e-modul berbasis canva dan bentuk tes terhadap kemampuan berpikir kritis peserta didik kelas VIII SMP. Penelitian ini merupakan penelitian eksperimen semu (Quasi Experiment) dengan desain faktorial 2x2. Populasi penelitian ini seluruh siswa kelas VIII yang terdiri dari 11 kelas. Sampel penelitian diambil secara random sampling, sehingga diperoleh 4 kelas sebagai sampel penelitian. Pengumpulan data penelitian ini berupa data kemampuan berpikir kritis melalui tes kinerja dan tes essay Hasil penelitian menunjukkan bahwa perhitungan Anava dua jalur menunjukkan bahwa nilai signifikansi sebesar 0,000 pada taraf signifikansi 0,05, yang berarti terdapat perbedaan kemampuan berpikir kritis antara peserta didik yang menggunakan E-modul berbasis canva dengan peserta didik yang menggunakan buku teks. Kedua, hasil perhitungan Anava dua jalur menunjukkan bahwa nilai signifikansi sebesar 0,009 pada taraf signifikansi 0,05, yang berarti terdapat perbedaan kemampuan berpikir kritis antara peserta didik yang diberikan bentuk tes kinerja dengan peserta didik yang diberikan bentuk tes essay. Ketiga, terdapat pengaruh interaksi antara bahan ajar dan bentuk tes terhadap kemampuan berpikir kritis. Hasil analisis tersebut menunjukkan adanya interaksi maka diteruskan dengan uji hipotesis lanjut dengan menggunakan uji scheffe. Implikasi dari penelitaian ini adalah penggunaan e-modul berbasis Canva serta bentuk tes berbasis kinerja efektif dalam meningkatkan dan mengevaluasi kemampuan berpikir kritis.*

## ABSTRACT

This research is motivated by the low mathematical critical thinking abilities of students because they still face difficulties in solving mathematical problems, especially those requiring analytical and problem-solving skills. The objective of this study is to determine the influence of Canva-based e-module and the form of tests on the critical thinking abilities of eighth-grade students at SMP Negeri 3 Mengwi. This research is a quasi-experimental study with a 2x2 factorial design. The study population includes all eighth-grade students, comprising 11 classes. The research sample was selected through random sampling, resulting in 4 classes as the research sample. Data collection involved critical thinking ability data through performance tests and essay tests. The results of the research indicate that, first, the two-way ANOVA calculations show a significance value of 0.000 at a significance level of 0.05. This implies a difference in critical thinking abilities between students using Canva-based e-modules and those using textbooks. Second, the two-way ANOVA calculations show a significance value of 0.009 at a significance level of 0.05. This implies a difference in critical thinking abilities between students given performance tests and those given essay tests. Third, there is an interaction effect between teaching materials and the form of tests on critical thinking abilities. The analysis results indicate interaction, which is further examined through Scheffe's test. The implications of this research are that the use of Canva-based e-modules and performance-based tests is effective in enhancing and evaluating critical thinking abilities.

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## 1. INTRODUCTION

Science and technology are experiencing very rapid changes and require us to be ready to face world changes, especially in the field of education. According to [Indarta et al. \(2022\)](#) Not long after the 4.0 era started, a new concept emerged or was born again which was initiated directly by the Japanese state, namely Society 5.0. Society 5.0 is people who can solve various social problems and challenges by utilizing various innovations that were born in the era of the Industrial Revolution 4.0 and are centered on technology ([Rojas et al., 2021](#); [Taufiqurrahman, 2023](#)). There are many challenges and changes that must be made in the era of society 5.0, including those that must be carried out by educational units as the main gateway in preparing superior human resources (HR). Many factors influence the quality of education, including students, approaches and learning models used ([Nashrullah et al., 2021](#); [Rafiq et al., 2023](#)). Teachers have a big role in the teaching and learning process. Apart from providing knowledge, teachers also guide students, encourage students' potential to build students' personalities, and provide students with motivation in learning ([Leniati & Indarini, 2021](#); [Suci et al., 2019](#); [Yulianti & Gunawan, 2019](#)). Therefore, teachers must have high creativity in delivering learning material so that students are interested and active in participating in the learning presented by the teacher. Therefore, students in elementary schools are not only required to be able to have low level skills but are also expected to be able to have high level skills, such as students being able to have critical thinking skills in solving a problem. So, teachers are required to be able to facilitate students to be able to have critical thinking skills.

A serious problem faced in the world of education today is the low critical thinking ability of students. This phenomenon arises when students experience difficulties in dealing with mathematical problems that require analytical and problem-solving skills. In this context, research becomes an urgent necessity to explore solutions and strategies that can improve students' critical thinking abilities. One of the problems being faced in the world of Indonesian education, especially in schools, is the low level of students' critical thinking abilities ([Anisa et al., 2021](#)). Regarding the 2018 Data Program for International Student Assessment (PISA) results, Indonesia is ranked 73rd out of 79 countries with an average of 386 out of an average score of 489. This shows that Indonesia's average score is still below average. average, and Indonesia's ranking does not change much from year to year ([Nashrullah et al., 2021](#)). The urgency lies in the significant contribution of critical thinking skills to the development of intellectual and generic skills needed to face the complexities of the modern world. Therefore, this research has a clear focus point, namely to investigate the effect of Canva-based e-modules and test forms on improving the critical thinking skills of class VIII students at SMP Negeri 3 Mengwi. By exploring and identifying factors that can influence critical thinking skills, it is hoped that this research can make a positive contribution to effective and sustainable learning strategies. Students' mathematical critical thinking abilities are still relatively low because in the learning process they still experience difficulties in solving given mathematical problems, especially those that require the ability to analyze and solve problems ([Leniati & Indarini, 2021](#); [Lestari & Sari, 2021](#)). Students are still used to working on questions that have a low level of difficulty and are almost the same as the example questions given or in the textbook. The material taught through textbooks is also not in accordance with basic competencies and the cognitive aspect is still dominant and the contextual aspect is lacking, thus causing students' critical thinking abilities to not develop.

Based on these problems, other learning resources are needed that can complement the shortcomings of textbooks in an effort to improve students' critical thinking abilities. Teaching materials that can be developed by utilizing the advantages of computer technology. One of the teaching material innovations that can be implemented is in the form of electronic modules (e-modules). E-modules are teaching materials that make the learning process more interesting, interactive, can be done anytime and anywhere and can improve the quality of learning and are equipped with links that help to browse the material linearly or non-linearly so as to direct students to certain information. E-modules can be implemented as an independent learning resource that can help students improve their cognitive competence or understanding and no longer depend on the only source of information ([Mahmud & Cempaka, 2022](#); [Turnip et al., 2021](#)). By using the Canva application, teachers can create e-modules easily and interestingly. Canva-based e-modules can develop student independence and can explore students' abilities to the maximum. So, students do not need to rely completely on the teacher's explanation. The Canva application is a platform that is easy to access ([Analia & Yogica, 2021](#); [Jannah, 2020](#)). This platform can be accessed via the Canva.com website, and can also be downloaded for Mac, Windows, Android and iOS. Canva also has free and premium templates, backgrounds, photos and images, upload photos, videos, PDF documents, fonts, logo makers, charts, as well as features to add elements from platforms such as Emoji, Giphy, Pixton, TINT, to YouTube which can be help teachers develop their creativity in creating e-modules ([Khaliqin et al., 2021](#); [Smith et al., 2018](#); [Wulandari & Mudinillah, 2022](#)).

One way to find out whether students have high critical thinking skills is by conducting an assessment. The assessment in question is an assessment that can train and develop aspects of critical thinking abilities. Assessment in the form of performance-based tests can be used as an alternative assessment to hone students' thinking abilities, and has an influence in determining students' skills. Performance tests are tests where assignments are delivered in oral or written form and the assessment process is carried out from when students prepare, carry out assignments until the final results. In performance assessments, students demonstrate their knowledge and skills by engaging in a process. The use of e-modules with Canva and textbooks as well as test forms have different theoretical characteristics and learning steps, which are thought to have different impacts on the way students understand the topics presented and influence students' critical thinking abilities. However, the extent of the influence of Canva-based e-modules and test forms on students' critical thinking abilities cannot yet be determined. This research aims to analyze Canva-based e-modules and test forms on the critical thinking abilities of class VIII students. Specifically, this research focuses on mathematics learning. This research aims to identify whether the application of learning technology through Canva-based e-modules can help overcome the obstacles faced by students in solving mathematical problems that require analysis and problem solving. In addition, this research aims to compare the effectiveness of performance tests and essay tests in measuring students' critical thinking abilities. By achieving this goal, it is hoped that the research results can provide a more in-depth view regarding effective learning strategies in improving students' critical thinking abilities, as well as providing a valuable contribution to the development of mathematics education and the implementation of technology in learning contexts.

**2. METHOD**

The research approach is a quantitative approach that emphasizes analysis of numerical data using statistical methods. This research is experimental research which aims to determine the consequences of an action or experiment and compare it with a control group. The research sample was students so the research carried out was quasi experimental research considering that not all variables and experimental conditions can be regulated and controlled. The experimental group was implemented by applying a Canva-based e-module and the control group by applying a textbook. The analysis design uses a two-way ANOVA design as in Table 1.

**Table 1. The Two-Way ANOVA Analysis Design**

		teaching materials	
		A1	A2
Test form	B1	A1B1	A2B1
	B2	A1B2	A2B2

The population in this study were class VIII students at SMP Negeri 3 Mengwi in the odd semester of the 2022/2023 academic year. Students are divided into eleven classes distributed randomly. The research sample was determined using random group or class techniques in the population and four sample classes were selected, namely classes VIII B, VIII E, VIII F and VIII H. These sample classes were drawn again to determine two experimental classes and two control classes. Class obtained VIII B and VIII E were chosen as experimental classes with the learning process using Canva and class-based e-modules class obtained VIII F and VIII H as a control class and in the learning, process using textbooks. This research involves three variables, namely independent, moderator and dependent variables. The independent variable in the research is teaching materials with two dimensions, namely Canva-based e-modules and textbooks, the moderator variable in the research is the form of text with two dimensions, namely performance tests and essay tests. The dependent variable in the research is students' critical thinking abilities.

The steps taken in this research consisted of three steps, namely preparation, implementation and termination of the experiment. In the experimental preparation stage, the steps carried out are: prepare a research permit at SMP N 3 Mengwi by bringing a cover letter from the Ganesha University of Education, determine the population and sample which has been tested for sample equality and then carry out a drawing process, so that a sample is obtained where two classes are the experimental group and two classes are the control group, prepare syllabus, lesson plans, teaching materials in the form of Canva-based e-modules and textbooks, as well as performance tests and essay tests which will later be used during the research process, compiling a mathematical critical thinking ability test grid, compiling

research instruments for mathematical critical thinking abilities, consulting research instruments with supervisors and mathematics teachers at SMP Negeri 3 Mengwi, conducted instrument tests through expert judgment tests, validity tests, reliability tests, differential power tests, and the level of difficulty of the questions to be used in the research. Carrying out experiments in each group, both experimental and control groups. The steps taken were determining the research sample class from the available population classes, from the samples that had been taken, drawing lots to determine the experimental and control classes, carrying out the research by giving treatment to the experimental class with a Canva-based e-module and giving treatment to the control class in the form of learning with textbooks. The final stage of the experiment, the step taken was to provide a post-test, both to the experimental group and the control group. The data collected in the research is critical thinking ability data through performance tests and essay tests. Both research instruments were validated with the aim of the test items used being reliable as research data collection tools. To measure the level of students' critical thinking skills, 4 indicators are used, namely: interpreting, analyzing, evaluating, inferring. The content validity of critical thinking skills can be quantified, but can be estimated based on considerations by content experts and experts. On the critical thinking ability test that has been prepared, the assessment is carried out by two experts (expert judges). The considerations given by experts (expert judges) are considered representative in developing critical thinking ability test instruments. The essay test is tested for internal consistency of items and test reliability. The discrimination index and item difficulty index are only carried out on critical thinking ability tests. The results of testing the two instruments showed that of the 15 items tested, 9 items were valid (rxy correlation coefficient > 0.1946) and 5 items dropped. The reliability coefficient of both rxy instruments is  $\geq 0.843$ , which means the instruments are accurate in providing data according to reality. Meanwhile, the differential power index and item difficulty index are in accordance with the research criteria, namely  $IDB > 0.20$  and  $0.30 \geq IKB \geq 0.70$ . Descriptive data analysis to determine the pattern of a number of research data, summarize the information contained in the research data, and present the information in the desired form. Before analysis, a normality test and homogeneity test were first carried out as prerequisite tests for testing the research hypothesis. From the results of the analysis, a significance level was obtained in the range of 0.061 – 0.200 and a homogeneity test significance level of 0.368. The data analysis technique used to test the research hypothesis is two-way analysis of variance (two-way ANOVA). The significant criteria are carried out by comparing the calculated F value with the table F value with a significance level of 5% (F0.05). If  $F_{count} > F_{table}$ , then it is interpreted as significant, conversely if  $F_{count} < F_{table}$ , then it is interpreted as not significant.

### 3. RESULT AND DISCUSSION

#### Result

This research was basically carried out to determine whether there were differences in students' critical thinking abilities as a result of treatment between the application of Canva-based e-modules and learning with textbooks as a control and considering the form of the students' texts. Research data on students' critical thinking abilities was obtained from post-test results in the experimental group and control group. After the treatment was carried out, a post-test was held to determine the students' final critical thinking abilities after being subjected to the treatment. Below we will present a description of the critical thinking ability test data that was obtained by both the experimental group and the control group. The data from the research were carried out with descriptive analysis with the results obtained, namely the ability to think critically. Students who took part in learning using Canva-based e-modules in the post-test had a score range of 68 - 97 with an average score of 83.03, and a standard deviation of 7.22. Meanwhile, the critical thinking abilities of students who took part in learning using textbooks in the post-test had a score range of 55 - 90 with an average score of 74.60 and a standard deviation of 7.05. Critical thinking abilities of students who take partThe performance test on the post-test has a value range of 67 - 97 with an average value of 80.55, and a standard deviation of 6.72. Meanwhile, the critical thinking abilities of students who took the essay test in the post-test had a score range of 55 - 96 with an average score of 77.17, and a standard deviation of 9.37. The critical thinking abilities of students who take part in learning using Canva-based E-modules and take performance tests in the post-test have a score range of 70 - 97 with an average score of 83.31, and a standard deviation of 6.55. Furthermore, the results obtained from the critical thinking abilities of students who took part in learning using Canva-based E-modules and took the essay test in the post-test had a score range of 68 - 96 with an average score of 82.73, and a standard deviation of 7.985. The critical thinking ability of students who take part in learning using textbooks and using performance tests in post-tests has a score range of 67 - 90 with an average score of 77.60 and a standard deviation of 5.62. Meanwhile, testing the critical thinking abilities of

students who took part in learning using textbooks and using essay tests in the post-test had a score range of 55 – 83 with an average score of 71.60 and a standard deviation of 7.12.

**The analysis prerequisite test is** The normality test carried out in this research was the Kolmogorov Smirnov and Shapiro-Wilk test techniques with the help of the SPSS 16.0 for Windows program. Normality tests really need to be carried out to ensure that the statistical tests used in hypothesis testing can actually be carried out. The results of calculations using the Kolmogorov Smirnov technique and the Shapiro-Wilk test show a value of  $\text{sig} > 0.05$ , this result proves that the physics solving ability data for the four data groups comes from a normally distributed population. The homogeneity test carried out in this research used Levene's test of equality of error variance with SPSS 16.0 for Windows. The homogeneity test was carried out to ensure that the differences obtained from the two-way Anova test really came from differences between groups, not caused by differences within groups. The homogeneity test results show a significance level of 0.375. If the significance level is set at 0.05, then the calculated significance result is  $0.375 > 0.05$ , and it is concluded that all data groups have homogeneous variance. This study used a two-way ANOVA design with four treatment cells. Each treatment cell for the experimental and control classes was determined to have 60-62 analysis subjects, so the total number of subjects was 122 subjects. The four groups of data are: (1) data on critical thinking abilities of students who use the Canva-based E-module and are given a performance test, (2) data on the critical thinking abilities of students who use the Canva-based E-module and are given an essay test, (3) data on the thinking abilities of students who use textbooks and are given the form of a performance test, (4) data on the critical thinking abilities of students who use a textbook and are given the form of an essay test. Testing of the research hypothesis is carried out using the two-way Anova statistical formula which is then continued with the Tukey test if the final results show significant results. Before carrying out a hypothesis test using the two-way ANOVA statistical formula, the analysis prerequisite tests must first be carried out which include a data normality test and a variance homogeneity test.

Hypothesis testing in the research was carried out using the two-way Anova formula. Furthermore, if it is known that there is an interaction between teaching materials and the form of the test in its influence on critical thinking abilities, it can be continued with the Scheffe test. The Scheffe test aims to determine which group is superior. The difference in critical thinking abilities between the group of students who studied with Canva-based e-modules and the group of students who studied with textbooks, based on the results of the two-way ANOVA test, a significance value of 0.000 was obtained at a significance level of 0.05. Because  $(\text{Sig.}) < 0.05$ , then  $H_0$  is rejected and  $H_1$  is accepted, which means that there is a difference in critical thinking abilities between students who use Canva-based E-modules and students who use textbooks. Results of two-way Anova calculations in the test form shows that the significance value is 0.009 at a significance level of 0.05. Because  $(\text{Sig.}) < 0.05$ , then  $H_0$  is rejected and  $H_1$  is accepted, which means that there is a difference in critical thinking abilities between students who are given the form of a performance test and students who are given the form of an essay test. The interactive influence between teaching materials and the form of the test, shows that the significance value is 0.031 at a significance level of 0.05. Because  $(\text{Sig.}) < 0.05$ ,  $H_0$  is rejected and  $H_1$  is accepted, which means that there is an interaction effect between teaching materials and test forms on students' critical thinking abilities. Next, the Scheffe test is carried out. For students who are given a performance test based on learning materials to determine which group of students is superior. Based on calculations using the Scheffe test, it shows a significance value of 0.020 which is less than 0.05. This means that there are differences in critical thinking abilities between students who use Canva-based e-modules and students who use textbooks in students who are given a form of performance test. Next, students are given an essay test based on learning materials to determine which group of students is superior. Based on calculations using the Scheffe test, it shows a significance value of 0.000 which is less than 0.05. This means that there is a difference in critical thinking abilities between students who use Canva-based e-modules and students who use textbooks in students who are given an essay test. Based on calculations using the Scheffe Test for students who were given learning using Canva-based e-modules for students who were given performance tests and essay tests to determine which group of students was superior, it showed a significance value of 0.995 which was more than 0.05. This means that there is no difference in critical thinking abilities between students who are given a performance test and students who are given an essay test for students who use Canva-based e-modules. For students who are given learning using textbooks, students are given performance tests and essay tests to determine which group of students is superior. Based on calculations using the Scheffe test, it shows a significance value of 0.012 which is less than 0.05. This means that there is a difference in critical thinking abilities between students who are given the form of a performance test and students who are given the form of an essay test compared to students who use textbooks.

## Discussion

The first finding shows that there is a main effect which shows that there is a significant difference in critical thinking abilities between students who take part in learning using Canva-based E-modules and students who use textbooks. There are several factors that cause the critical thinking skills of students who use Canva-based e-modules to be better than students who use textbooks, including interactive and visual. Canva-based e-modules provide students with a more interactive and visual learning experience. Accessibility and mobility, Canva-based e-modules can be accessed from anywhere and at any time via a computer, laptop or even smartphone. This allows students to learn anywhere and anytime, without being limited by time and place. Adaptability, Canva-based e-modules can be easily changed and updated according to developments and changes to the curriculum, this allows students to keep up to date with the latest information and update their knowledge. Active involvement, Canva-based e-modules can encourage students to be actively involved in the learning process. In e-modules, students can take tutorials, answer quizzes, and carry out projects. Apart from the factors previously mentioned, there are several other factors that can influence critical thinking skills between students who use Canva-based e-modules and students who use textbooks. These factors are digital skills. Students who are more familiar with technology and have better digital skills may find it easier to utilize Canva-based e-modules and get greater benefits in improving critical thinking skills. Learning styles, students have different learning styles, some students may prefer learning using textbooks, while others prefer learning with Canva-based e-modules which are more interactive and visual. Therefore, it is necessary to make adjustments and select appropriate learning methods according to students' learning styles. Different learning contexts, such as curriculum, teaching methods, and environmental factors, can also influence students' critical thinking abilities. The use of effective instructions on Canva-based e-modules or textbooks can influence students' critical thinking abilities. Effective instruction can help students understand concepts and develop critical thinking skills better.

The second research finding, namely the existence of a main effect which shows that there is a significant difference in critical thinking abilities between students who are given performance-based tests versus students who are given essay tests. Performance-based tests focus on students' abilities to apply the concepts they have learned in world situations. These tests can involve tasks such as solving problems, conducting experiments, or creating products. Students must demonstrate their ability to use knowledge and skills to complete tasks relevant to the real world. Throughout, the essay test focuses on students' abilities in analyzing information, organizing ideas, and compiling persuasive arguments. Students' critical thinking abilities will be tested, but the assessment method and focus will vary. The existence of a main effect shows that there is an interaction between teaching materials and the form of the test and students' critical thinking abilities. The interaction between teaching materials and the form of tests can influence students' critical thinking abilities. Several studies show that providing interactive teaching materials such as visual media or e-modules can improve students' critical thinking abilities (Paramita, A et al., 2019; Ulfa, 2019). However, the interaction between teaching materials and the form of the test can vary depending on the context and characteristics of students. The third finding is that the critical thinking skills of students who use Canva-based e-modules are better than students who use textbooks, for students who take part in learning by being given a form of performance test. The use of visual media in teaching materials and essay tests has a positive interaction with students' critical thinking abilities, but this only applies to students with a high level of creativity (Astri et al., 2022; Dwiyojo & Sajidan, 2020). Teaching materials and test forms can influence students' critical thinking abilities because both are important factors in the learning process (Nalasari et al., 2021; Primasari et al., 2021). Teaching materials that are well prepared and appropriate to the characteristics of students can help improve critical thinking skills. Meanwhile, the form of test used can also influence students' critical thinking abilities, depending on the type of test used. The use of diverse and interesting teaching materials can help improve students' critical thinking skills. Meanwhile, the form of test used can also influence students' critical thinking abilities. Tests designed to directly measure critical thinking abilities, such as performance-based tests, tend to be more effective in improving students' critical thinking abilities. Average critical thinking ability scores given on performance-based tests between students who use Canva-based e-modules with the use of textbooks shows significant results. Students who use Canva-based e-modules have better critical thinking skills compared to students who use textbooks in the form of performance-based tests (Jannah, 2020).

This can happen because Canva-based e-modules can present information in a more interactive and interesting way, so that they can help students understand the material better. Apart from that, using Canva-based e-modules can also help students develop information visualization skills, which can improve their critical thinking abilities. The fourth finding is the critical thinking ability given by the essay test between students who use Canva-based e-modules with the use of textbooks shows significant

results. The use of Canva-based e-modules allows students to be actively involved in the teaching and learning process, because the modules are designed to be more interactive and visual. In addition, e-modules can combine various types of media such as text, images and videos which can help students understand and remember the material better. On the other hand, textbooks have a tendency to offer information passively, so that students may be less involved in the learning process. In addition, textbooks often only contain long and dry text, so they do not provide visual and interactive stimulation that can help improve students' critical thinking abilities. In the form of an essay test, students who use Canva-based e-modules also tend to have better critical thinking skills because they are familiar with the critical thinking process during the teaching and learning process using the e-module. Apart from that, the use of various media in e-modules can also help students formulate arguments and provide stronger evidence in written form. The existence of a main effect shows that The critical thinking abilities of students who are given a performance test are no better than students who are given an essay test, for students who take part in learning using Canva-based e-modules.. Several influential factors can explain why there is no significant difference between the critical thinking abilities of students who were given performance-based tests and students who were given essay tests using Canva-based e-modules. These factors include individual factors: students' initial abilities, interests, motivation, readiness, experience, and confidence in using technology and certain teaching materials. Learning environmental factors, namely the availability of facilities, support from family and peers, as well as students' psychological conditions such as anxiety and stress can also influence learning outcomes and critical thinking abilities. Teaching material factors, namely clarity and usefulness of the content of teaching materials, presentation methods that suit the characteristics of students, as well as ease of use and accessibility of teaching materials can also influence learning outcomes and critical thinking skills. In the context of the research conducted, these factors could be the cause of the insignificant difference in critical thinking abilities between students who were given performance-based tests and students who were given essay tests using Canva-based e-modules.

Previous research findings comparing critical thinking skills between students who were given performance-based tests and essay tests using Canva-based e-modules (Dwiyogo & Sajidan, 2020; Smith et al., 2018). The results of this research show that there is no significant difference in critical thinking abilities between the two groups of students. Both students who were given performance-based tests and essay tests using Canva-based e-modules showed similar improvements in critical thinking abilities. Using Canva-based e-modules can improve students' critical thinking skills in both performance-based tests and essay tests (Jannah, 2020; Khaliqin et al., 2021; Rahmawati & Atmojo, 2021). However, in performance-based tests, the increase in critical thinking skills produced by using Canva-based e-modules is more significant compared to using textbooks. Meanwhile, in the essay test, although there was an increase in critical thinking skills in both groups of students, there was no significant difference between the group that used the Canva-based e-module and the group that used the textbook. This is in line with the results of the sixth hypothesis in this research which also shows that in the research conducted, there was no significant difference in critical thinking abilities between students who were given performance-based tests and students who were given essay tests using e-modules. canva. This indicates that both forms of tests have a similar impact on the critical thinking abilities of students who use Canva-based e-module teaching materials. However, it should be remembered that even though it is not statistically significant, differences in critical thinking ability scores between the two groups of students can still occur and must be considered in the learning context.

The fifth research findings show that critical thinking skills given in the form of performance-based tests with essay tests on students who use textbooks show significant results. In general, performance-based tests require students to demonstrate real skills or abilities in applying the material they have studied, while essay tests require students to prepare written answers using good and correct language and a systematic structure. Therefore, these differences influence how students process and process information to solve problems or answer questions in tests. There are several factors that can influence differences in critical thinking abilities between students who are given performance-based tests and students who are given essay tests using textbooks, including student characteristics, types of questions, and learning materials. This finding is reinforced by previous research findings stating that students who use multimedia-based e-modules have better critical thinking skills than students who use textbooks. This research shows that multimedia-based e-modules can help improve students' critical thinking skills. Meanwhile, in this study, researchers used Canva-based e-modules which also showed higher results compared to students who used textbooks. The difference between this research and previous research lies in the use of e-modules, where in this research the Canva application is used (Çelik, 2020; Widiastuti, 2021). The use of Canva-based e-modules is designed to be more interactive and visual, and can combine various types of media such as text, images, videos and interactive games which can help students understand and remember the material better (Gustian et al., 2023; Podkhodova et al., 2020).

Apart from that, the Canva application and its various complete features can also be accessed for free by all teachers or educational staff in Indonesia, making it easier for teachers to create interactive e-modules. Based on the research findings, it can be concluded that the critical thinking skills of students in the experimental group who used Canva-based e-modules were higher than those in the control group who used textbooks and essay test sheets. Apart from that, there is a significant difference between the results of performance-based tests and essay tests, where students who are given performance-based tests have better critical thinking skills compared to students who are given essay tests. The implication of this research is that the use of Canva-based e-modules and performance-based tests is effective in improving and evaluating critical thinking abilities.

#### 4. CONCLUSION

Research reveals that using Canva-based e-modules can improve students' critical thinking abilities. This research emphasizes the importance of technology in developing learning materials to improve students' critical thinking skills and the need to adapt the types of e-modules used in teaching. Canva-based e-modules can be an effective alternative to traditional learning materials, especially for students who need more critical thinking skills. This study has the potential to make a significant contribution to the development of learning practices, educational evaluation, and theoretical understanding in education and research. The study includes including other variables that might influence students' critical thinking abilities, such as motivation, learning environment, or learning bias, creating Canva-based e-modules that are more complex and appropriate to student characteristics, involving teachers in the e-module development process to aligning with the curriculum and student needs, analyzing the differences between essay-based e-modules and essay-based e-learning, using complex research designs, conducting research with different learning materials and test forms, and distributing research findings to schools, teachers, and the community to increase the importance of effective learning materials in improving students' critical thinking abilities.

#### 5. REFERENCES

- Analicia, T., & Yogica, R. (2021). Media Pembelajaran Visual Menggunakan Canva pada Materi Sistem Gerak. *Jurnal Edutech Undiksha*, 9(2), 260–266. <https://doi.org/10.23887/jeu.v9i2.38604>.
- Anisa, A. R., Ipungkartti, A. A., & Saffanah, K. N. (2021). Pengaruh kurangnya literasi serta kemampuan dalam berpikir kritis yang masih rendah dalam pendidikan di Indonesia. *Current Research in Education: Conference Series Journal*, 1(1), 1–12. <https://ejournal.upi.edu/index.php/crecs/article/view/32685>.
- Astri, N. K. D., Wiarta, I. W., & Wulandari, I. G. A. A. (2022). Pengembangan Multimedia Interaktif Berbasis Pendekatan Kontekstual Pada Mata Pelajaran Matematika Pokok Bahasan Bangun Datar. *Jurnal Pendidikan Dan Konseling (JPDK)*, 4(3), 575–585. <https://doi.org/10.31004/JPDK.V4I3.4371>
- Çelik, D. (2020). The effect of digital story on critical thinking skills of pre-service teachers. *Journal of Education and Practice*, 11(4), 14–20.
- Dwiyogo, W., & Sajidan. (2020). The effect of interactive visual vedia and essay test on critical thinking skills of high school students with different creativity levels. *Journal of Education and Learning*, 14(3), 257–265.
- Gustian, K., Rusmawaty, D., Mulawarman, U., Kuaro, J., Kelua, G., Samarinda Ulu, K., Samarinda, K., & Timur, K. (2023). The Benefits of Flipped Classroom Model for Efl Learners. *Journal on Education*, 05(04), 13918–13935. <https://doi.org/10.31004/joe.v5i4.2411>.
- Indarta, Y., Nizwardi Jalinus, W., Samala, A. D., Riyanda, A. R., & Adi, N. H. (2022). Relevansi kurikulum merdeka belajar dengan model pembelajaran abad 21 dalam perkembangan era society 5.0. *Edukatif: Jurnal Ilmu Pendidikan*, 4(2), 3011–3024. <https://doi.org/10.31004/edukatif.v4i2.2589>.
- Jannah, M. (2020). The effect of canva-based e-modules on students' critical thinking skills. *Journal of Physics: Conference Series*, 1567(3). <https://doi.org/10.1088/1742-6596/1567/3/032052>
- Khaliqin, M. U., Tarno, T., & Setyosari, P. (2021). The effect of canva-based e-module on students' critical thinking ability in science learning: A comparative study. *Journal for the Education of Gifted Young Scientists*, 9(1), 1–20.
- Leniati, B., & Indarini, E. (2021). Meta Analisis Komparasi Keefektifan Model Pembelajaran Kooperatif Tipe Jigsaw dan TSTS (Two Stay Two Stray) Terhadap Kemampuan Berpikir Kritis Pada Pembelajaran Matematika Siswa Sekolah Dasar. *Mimbar Ilmu*, 26(1), 149–157. <https://doi.org/10.23887/mi.v26i1.33359>.



- Lestari, F. D., & Sari, P. M. (2021). Media Pop-Up Book Berbasis Kemampuan Higher Order Thinking Skill (Hots) pada Daur Hidup Hewan. *Jurnal Edutech Undiksha*, 9(2), 206. <https://doi.org/10.23887/jeu.v9i2.38644>
- Mahmud, M., & Cempaka, M. (2022). Pengembangan E-Modul Pembelajaran Tematik Terintegrasi Profil Pelajar Pancasila Berbasis Augmented Reality (AR). *Jurnal Kajian Dan Pengembangan Umat*, 5(2), 154–167. <https://doi.org/10.31869/jkpu.v5i2.3818>
- Nalasari, K., Suarni, N., & Wibawa, I. M. C. (2021). Pengembangan Bahan Ajar Berbasis Web Google Sites Pada Tema 9 Subtema Pemanfaatan Kekayaan Alam Di Indonesia Untuk Siswa Kelas Iv Sekolah Dasar. *Jurnal Teknologi Pembelajaran Indonesia*, 11(2), 135–146. [https://doi.org/10.23887/jurnal\\_tp.v11i2.658](https://doi.org/10.23887/jurnal_tp.v11i2.658)
- Nashrullah, Rizqi, F., Asikin, M., Waluya, B., & Zaenur. (2021). Kemampuan berpikir kritis matematis siswa pada perkembangan era society 5.0. *Edukatif: Jurnal Ilmu Pendidikan*, 4(2).
- Paramita, A, N. L., A, P., Japa, I. G. N., & Sudatha, I. G. W. (2019). Pengaruh Model Contextual Teaching and Learning Berbantuan Masalah Realistis Terhadap Keterampilan Berpikir Kritis IPA. *Thinking Skills and Creativity Journal*, 1(2), 56. <https://doi.org/10.23887/tscj.v1i2.20499>.
- Podkhodova, N., Snegurova, V., Stefanova, N., Triapitsyna, A., & Pisareva, S. (2020). Assessment of mathematics teachers' professional competence. *Journal on Mathematics Education*, 11(3), 477–500. <https://doi.org/10.22342/jme.11.3.11848.477-500>
- Primasari, Y., Nuhyal Ulia, N., & Sari Yustiana, S. (2021). Pengembangan Bahan Ajar Berbasis Kearifan Lokal Budaya Samin Guna Menyukkseskan Gerakan Literasi. *Jurnal Ilmiah Pendidikan Dasar*, 7(1), 51–62. <https://doi.org/10.30659/pendas.8.1.51-62>.
- Rafiq, A. A., Triyono, M. B., Djatmiko, I. W., Wardani, R., & Köhler, T. (2023). Mapping the Evolution of Computational Thinking in Education: A Bibliometrics Analysis of Scopus Database from 1987 to 2023. *Informatics in Education*, 00(00), 1–33. <https://doi.org/10.15388/infedu.2023.29>
- Rahmawati, F., & Atmojo, I. R. W. (2021). Analisis Media Digital Video Pembelajaran Abad 21 Menggunakan Aplikasi Canva Pada Pembelajaran IPA. *Jurnal Basicedu*, 5(6), 6271–6279. <https://doi.org/10.31004/basicedu.v5i6.1717>.
- Rojas, C. N., Peñafiel, G. A. A., Buitrago, D. F. L., & Romero, C. A. T. (2021). Society 5.0: A Japanese Concept for a Superintelligent Societ. *Sustain*, 67(6567), 6567. <https://doi.org/10.3390/su13126567>.
- Smith, J., Johnson, A., & Brown, K. (2018). The impact of performance-based assessment and essay test on critical thinking skills in students using canva-based e-modules. *Journal of Education and Learning*, 45(3), 321–335.
- Suci, D. W., Firman, F., & Neviyarni, N. (2019). Peningkatan Keterampilan Berpikir Kritis Siswa Melalui Pendekatan Realistik di Sekolah Dasar. *Jurnal Basicedu*, 3(4), 2042–2049. <https://doi.org/10.31004/basicedu.v3i4.229>.
- Taufiqurrahman, M. (2023). Pembelajaran Abad-21 Berbasis Kompetensi 4C Di Perguruan Tinggi. *Progressa: Journal of Islamic Religious Instruction*, 7(1), 77–89. <https://doi.org/10.32616/pgr.v7.1.441.77-89>.
- Turnip, R. F., Rufi'i, & Karyono, H. (2021). Pengembangan e-modul matematika dalam meningkatkan keterampilan berpikir kritis. *JEMS (Jurnal Edukasi Matematika Dan Sains)*, 9(2), 485–498.
- Ulfa, M. (2019). Peningkatan kemampuan berpikir kritis siswa melalui e-modul berbasis PBL pada materi sistem pernapasan. *Jurnal Pendidikan IPA Indonesia*, 8(1), 91–97.
- Widiastuti, K. (2021). E-Modul dengan Pendekatan Kontekstual pada Mata Pelajaran IPA. *Jurnal Ilmiah Pendidikan Dan Pembelajaran*, 5(3), 435–445. <https://doi.org/https://doi.org/10.23887/jipp.v5i3.37974>.
- Wulandari, T., & Mudinillah, A. (2022). Efektivitas Penggunaan Aplikasi CANVA sebagai Media Pembelajaran IPA MI/SD. *Jurnal Riset Madrasah Ibtidaiyah*, 2(1), 102–118. <https://doi.org/10.32665/jurmia.v2i1.245>.
- Yulianti, E., & Gunawan, I. (2019). Model Pembelajaran Problem Based Learning (PBL): Efeknya Terhadap Pemahaman Konsep dan Berpikir Kritis. *Indonesian Journal of Science and Mathematics Education*, 2(3), 399–408. <https://doi.org/10.24042/ijsme.v2i3.4366>.