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## Exploring the Impact of Discovery Learning and Self-Efficacy on Students' Critical Thinking Skills

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### ABSTRACT

Developing critical thinking skills can be achieved by applying innovative learning models, such as the discovery learning model. The Discovery Learning model has been implemented to enhance students' critical thinking skills. This research seeks to analyze the effect of the Discovery Learning model and Self-Efficacy on students' critical thinking abilities, as well as the interaction between these two factors in shaping critical thinking. Conducted as an experimental study. The research subjects were 60 Students of Indonesian Language Department in the first semester. The study utilized questionnaires to assess students' Self-Efficacy and tests to measure their critical thinking skills. Data analysis was carried out using a two-way Analysis of Variance. The findings revealed that: (1) the Discovery Learning model had a significant effect on students' critical thinking skills, as indicated by a hypothesis test analysis yielding an F-value of 22.409 with a significance level of  $0.00 < 0.05$ ; (2) Self-Efficacy also had a significant influence on students' critical thinking abilities, with an F-value of 46.780 and a significance level of  $0.010 < 0.05$ ; and (3) there was a significant interaction effect between the Discovery Learning model and Self-Efficacy on students' critical thinking skills, as demonstrated by an F-value of 5.187 and a significance level of  $0.027 < 0.05$ . Based on the findings of this study, the implementation of the discovery learning model can serve as an alternative approach to learning that enhances both self-efficacy and students' critical thinking skills

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### 1. INTRODUCTION

Discovery Learning is a learning model that emphasizes students' active involvement in the learning process, often through experimentation and problem-solving. In this model, the teacher acts as a facilitator, supporting and guiding students as they explore the learning material. Discovery Learning is rooted in the constructivist theory of learning psychology. Constructivism emphasizes that learning is an active process in which individuals actively construct their knowledge and understanding through experience and reflection.

The Discovery Learning model fosters active student engagement in the learning process and is regarded as an educational approach based on constructivist principles (Siregar et al., 2020; Rahmadhani et al., 2020; Ruslan et al., 2021). Within this framework, Discovery Learning focuses on students' active involvement in developing their understanding. This model consists of a series of instructional activities designed to maximize students' exploratory skills (Ramadhani et al., 2022; Dyamayanti et al., 2023).

The implementation of Discovery Learning in education offers several benefits, including: (1) Building deeper understanding: Students achieve a more profound understanding when they actively engage in the learning process compared to passively receiving information from teachers, (2) Developing critical thinking skills: By facing challenges and solving problems, students can enhance their critical thinking abilities. Critical thinking is a purposeful, reasoned, and goal-oriented way of thinking applied in decision-making (Yaldiz & Bailey, 2019). These benefits are supported by research findings that indicate the Discovery Learning model can enhance or foster critical thinking skills (Suwardi et al., 2022; Nugraha et al., 2020; Rizki et al., 2021; Mustikaningrum & Mediatati, 2021; Wafa & Jatmiko, 2022; Akhir et al., 2023).

Developing critical thinking skills is crucial in the teaching and learning process, as it plays a key role in achieving established learning goals. Enhancing these skills involves exposing students to multiple perspectives on issues or problems, helping them understand that there is no single approach to problem-solving. Instead, various viewpoints provide valuable insights for deeper comprehension (Dekker, 2020).

Nurturing critical thinking in students goes beyond improving academic performance; it also prepares them for success in life. These skills enable students to gain a more profound understanding of the subject matter by questioning, analyzing, and critically evaluating information, allowing them to grasp complex concepts. The ability to think critically is essential for effective learning and for overcoming challenges they may encounter in the future (Saepuloh et al., 2021). In today's digital era, where vast amounts of information are credible unreliable readily accessible, critical thinking has become increasingly important for making well-reasoned judgments (Hirai et al., 2022). This skill involves the ability to identify, analyze, and logically solve problems, leading to informed and rational decision-making.

The ability to think critically helps students become more independent in addressing and solving problems effectively. They can identify more critical and efficient solutions and face challenges with a more positive attitude. Furthermore, students with critical thinking skills can evaluate information objectively and distinguish strong arguments from weak ones. This enables them to adopt a more analytical approach to problems and questions. Critical thinking also aids students in constructing strong arguments and communicating their ideas clearly and persuasively (Prahani et al., 2023). Mastering a subject matter effectively also requires high-level critical thinking skills. High-level critical thinking involves (1) Understanding arguments and believing in their validity, (2) Critically evaluating arguments and trusting their credibility, and (3) Developing and defending arguments with strong support (Martaída et al., 2017).

The Discovery Learning model presents challenges, particularly in providing sufficient guidance to students to ensure they remain focused and achieve a correct understanding of the material being studied. Additionally, some studies indicate that Discovery Learning may not be effective in situations where students have limited prior knowledge of the subject or when the material being studied is complex. Therefore, this approach is often more effective when combined with other variables and tailored to the diverse needs and characteristics of the students.

In addition to the Discovery Learning model, another factor that can enhance students' critical thinking skills is their self-efficacy. Self-efficacy is a concept that focuses on an individual's evaluation of their capacity to successfully perform tasks in specific situations (Waddington, 2023). Self-efficacy refers to an individual's confidence in their ability to plan and carry out actions necessary to navigate academic

challenges (Huamán-Tapia et al., 2023). It reflects a person's perception of their skills and their capacity to effectively apply these abilities to achieve success (Capron Puzozzo & Sadrin, 2021). Self-efficacy plays a significant role in shaping students' critical thinking skills, as those with higher self-efficacy are more likely to exhibit strong critical thinking abilities (Barli Sihombing et al., 2018). Studies have demonstrated a correlation between self-efficacy and students' critical thinking proficiency (Dehghani et al., 2011).

Critical thinking is regarded as a fundamental skill that fosters creativity, independence, and scientific reasoning. However, developing this skill requires confidence in one's ability to analyze problems, identify relevant solutions, and draw well-supported conclusions. Research findings suggest that students' levels of critical thinking are influenced by their academic self-efficacy (Vachova et al., 2023).

There have been several studies on the influence of discovery learning on students' critical thinking skills, but no researchers have linked it with self-efficacy. In other words, most studies focus more on the individual aspects of discovery learning or self-efficacy, but not many have comprehensively examined the interaction between the two in improving critical thinking skills. In addition, moderating or mediating factors that can influence the relationships between discovery learning, self-efficacy, and critical thinking skills have not been studied in depth. Therefore, this study attempts to fill this gap by analyzing more broadly and deeply the relationship between these variables in various learning contexts.

There are three hypotheses of this study, namely (1) there is an influence of the Discovery Learning model on students' critical thinking, (2) there is an influence of Self-Efficacy on students' critical thinking, (3) there is an influence of interaction between Discovery Learning model and self-efficacy on students' critical thinking.

## 2. METHODS

### 2.1 Research Design

The research design employed in this study is quasi-experimental with independent, dependent, moderator, and control variables. Two groups were formed in this study: the experimental group and the control group. The independent variables in this study are the learning models, specifically the Discovery Learning Model and the Problem-Based Learning Model. The dependent variable is students' critical thinking skills, while self-efficacy serves as a moderating variable. The experimental group consisted of students treated with the Discovery Learning Model, while the control group consisted of students treated with the Problem-Based Learning. Thus, this research design represents a version of the nonrandomized control group pretest and post-test design (Ary & Razavieh, 2002), also known as the pretest and post-test non-equivalent factorialized control group design in the 2x2 factorial design version (Bruce W. Tuckman, 1999; Cohen, L., Manion, L., and Morrison, 2018).

### 2.2 Research Subjects

The subject selection technique used random sampling to determine the participants who would receive the Discovery Learning Model treatment and those who would receive the Problem-Based learning model treatment. The participants were students aged between 18 and 19 years old. Through random sampling, a total of 60 participants were obtained, consisting of 30 students in the experimental group and 30 students in the control group. The sample size of 60 was justified based on the need for sufficient statistical power to detect meaningful differences between groups while ensuring feasibility in terms of instructional implementation and data collection. Both groups consisted of students with varying levels of self-efficacy. In the experimental group, 14 students exhibited high self-efficacy, while 16 students had low self-efficacy. Similarly, the control group included 11 students with high self-efficacy and 19 students with low self-efficacy.

### 2.3 Research Procedure

The experimental research procedure consists of a series of steps undertaken by the researcher to evaluate hypotheses and obtain empirical evidence within a scientific investigation. The procedures

carried out in this study were as follows: (1) Determining the research subjects through random sampling, (2) Identifying students' self-efficacy by distributing questionnaires, (3) Conducting a pretest on all research subjects to assess their critical thinking skills before treatment, (4) Determining experimental and control groups, (5) Conducting research experiments, namely the experimental group was given treatment with the Discovery Learning Model and the control group was given treatment with the Problem Based Learning Model, and (5) Administering a post-test to assess students' critical thinking skills after they received the treatment with the learning model.

#### 2.4 Research Instruments

The instruments utilized in this study were divided into two categories: (a) a test designed to measure each subject's self-efficacy and (b) a test aimed at evaluating critical thinking skills. The self-efficacy instrument consists of a questionnaire designed to measure the students' self-efficacy levels. The questionnaire contains 17 statement items related to students' self-efficacy. A Likert scale with four response options was used for each question: Strongly Disagree (score of 1), Disagree (score of 2), Agree (score of 3), and Strongly Agree (score of 4). This test was administered to evaluate students' critical thinking skills. The research instrument was tested for reliability and validity before being used. The results of the reliability test of the self-efficacy instrument were  $\alpha = 0.86$  indicating that the self-efficacy questionnaire had a high level of reliability because the  $\alpha$  value was  $> 0.70$ . The validity results showed that the Content Validity Index (CVI) was 0.92 (very valid category). A CVI value  $\geq 0.80$  indicates that the instrument has been assessed by experts and has a high suitability with the concept of self-efficacy. The reliability test of the Critical Thinking Instrument was  $\alpha = 0.81$  (high-reliability category because the  $\alpha$  value was  $> 0.70$ ) and the validity results showed Kaiser-Meyer-Olkin (KMO) = 0.89 (very good category, ideally  $> 0.70$ ).

#### 2.5. Data Analysis Technique

Once the expected data had been collected, the next step was to analyze the research data using an appropriate data analysis technique according to the research type. In this study, there are two dependent variables, so the data analysis technique used is two-way ANOVA (Analysis of Variance). As stated by (Bruce W. Tuckman, 1999), variance analysis allows researchers to study the simultaneous effects of multiple independent variables, although its application has specific characteristics (two, three, or four variables). The use of a factorial research design includes independent variables, moderator variables, and dependent variables. The independent and dependent variables are referred to as factors. Hypothesis testing in this study is conducted in two stages: the assumption testing stage and the hypothesis testing stage.

##### 2.5.1 Normality and Homogeneity Test

The data analysis technique employed in this study was the Analysis of Variance (ANOVA). Before performing data analysis, an assumption test is conducted to ensure that the required conditions are met. As a parametric statistical method, ANOVA is based on several assumptions, including: (1) the sample must be drawn from a normally distributed population, (2) the variance among sample groups must be homogeneous, (3) the data must be measured on an interval or ratio scale, and (4) the research samples must be selected randomly (Sugiyono, 2019).

Prior to conducting inferential analysis to test the research hypothesis, it is essential to verify these assumptions through a normality test and a homogeneity test. The normality test is performed using the Lilliefors Significance Correction test from Kolmogorov-Smirnov, facilitated by the Statistical Package for the Social Sciences (SPSS) for Windows. Meanwhile, the homogeneity test is conducted using Levene's test, which is part of the ANOVA program package. The decision to confirm normality and homogeneity is based on a significance level of 5% ( $\alpha = 0.05$ ).

### 2.5.2 Hypothesis Testing

After ensuring that all parametric test assumptions, including normality and homogeneity, are met, the next step is hypothesis testing. This process aims to assess the impact of the Discovery Learning model and Self-Efficacy on students' critical thinking skills. Hypothesis testing in this study is carried out using the Analysis of Variance technique. The factorial ANOVA model is analyzed with the help of the Statistical Package for the Social Sciences (SPSS) for Windows. Additionally, ANOVA is used to examine the interaction effect between the two independent variables, Discovery Learning and Self-Efficacy, on students' critical thinking. The decision criterion for determining the influence of the independent variables on the dependent variable is based on a significance level of  $\alpha = 0.05$ , corresponding to a 5% margin of error or a 95% confidence level.

## 3. FINDINGS AND DISCUSSION

### 3.1 Research Results

The pretest conducted in both the experimental and control groups provided data on the initial abilities of each group, specifically their Critical Thinking skills. Assessing prior knowledge is essential to determine whether there is a significant difference between the two groups. If no significant difference is found in their initial abilities, the study can proceed as planned.

The descriptive data from the pretest, comparing students who received instruction using the Discovery Learning model with those taught through the Problem-Based learning model, were analyzed using the independent two-sample t-test statistical method. The results of the analysis, conducted using SPSS software, are presented in Table 1 below.

Table 3.1: Pre-test Data on Students' Critical Thinking Skills

Learning Models	N	Mean	Std. Deviation
Discovery Learning	30	66.59	3.90
Problem-Based Learning	30	66.13	3.86

Table 3.1 can be explained as follows: A total of 30 students taught critical thinking received a mean pretest score of 66.59 and a standard deviation of 3.901. Meanwhile, the group of 30 students taught with the Problem Based learning model had a mean pretest score of 66.13 and a standard deviation of 3.865. In other words, both the group taught with critical thinking and the group taught with the Problem Based learning model had similar mean pretest scores. This means that both groups of research subjects had the same level of critical thinking.

An independent sample t-test was conducted to assess whether there was a significant difference in pretest results between the two treatment groups. The findings from this statistical analysis are presented in the following table.

Table 3.2. Results of the t-test Analysis (Independent Sample t-test)

	Levene's Test for Equality of Variances	t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)
Pretest	Equal variances assumed	.090	.765	.454	57	.652

Based on Table 3.2, the pretest score analysis using the t-test indicates that the F-count value for the pretest results, obtained through the Equal Variance Assumed t-test, is 0.090 with a

significance level of 0.765. The t-count result is 0.454 with a degree of freedom (df) of 57 at a significance level of 0.652. Since the t-count value (0.454) is lower than the t-table value (1.978), the null hypothesis (Ho), which states that there was no difference in critical thinking skills between students taught using the Discovery Learning model and those taught with the Problem Based Learning model, is accepted. Therefore, it can be concluded that there was no significant difference in the pretest scores between the Discovery Learning group and the Problem Based Learning group.

Posttest data on Critical Thinking skills for both groups-students taught using the Discovery Learning model and those taught using the Problem Based Learning model-were analyzed using descriptive statistical methods. The results of the posttest analysis for Critical Thinking skills in both groups are presented in the following table.

Table 3.3 Summary of Results of Posttest Data Analysis of Critical Thinking Skills

Descriptive Statistics				
Learning Model	Self-Efficacy	Mean	Std. Deviation	N
Discovery Learning	High	89.26	4.763	17
	Low	86.52	3.654	13
	<b>Total</b>	<b>87.89</b>	<b>8.417</b>	<b>30</b>
Problem-Based Model	High	82.79	3.893	12
	Low	80.86	3.744	18
	<b>Total</b>	<b>81.82</b>	<b>7.637</b>	<b>30</b>
Total	High	87.89	8.817	29
	Low	81.82	7.637	31
	<b>Total</b>	<b>84.85</b>	<b>16.45</b>	<b>60</b>

Table 3.3 above presents the results of posttest data analysis, both posttest data from the Discovery Learning group and posttest data on the group of students who received treatment with the Problem Based-Learning Model. The data presented are related to the average, Standard Deviation, and number of students (N).

Posttest data (critical thinking) on the group of students who received treatment with Discovery Learning with high Self-Efficacy obtained a mean of 89.26; SD (Standard Deviation) of 4,763; and N of 17. While for students who had low Self-Efficacy types, the mean was 86.52; SD equals 3,654, and N equals 13. Overall, the critical thinking data of students who received treatment with Discovery Learning for both students who have high Self-Efficacy and those who have low Self-Efficacy obtained a mean of 87.89; SD of 8,417, and N of 30.

Data on critical thinking in the group of students who received treatment with the Problem-Based learning model and who had high Self-Efficacy obtained a mean of 82.79; SD (Standard Deviation) of 3,893; and N of 12. While students who had low Self-Efficacy obtained a mean of 80.86; SD of 3,744, and N of 18. The total number of critical thinking data that received Problem Based Model treatment for both students who had high Self-Efficacy and those who had low Self-Efficacy obtained a mean of 81.82; SD of 7,637, and N of 30

Based on the analysis, it can be concluded that overall critical thinking scores of students who received instruction using the Discovery learning model and those taught with the Problem Based Learning model-each group comprising students with both high and low Self-Efficacy-resulted in a mean score of 84.85, a standard deviation (SD) of 16.45, and a total sample size (N) of 60.

Additionally, a normality test was conducted in this study to assess the distribution of critical thinking scores among student groups based on (1) the learning model used (Discovery Learning and

Problem Based Learning) and (2) Self-Efficacy levels. The normality test was performed using the Lilliefors Significance Correction test from Kolmogorov-Smirnov, with a significance level ( $\alpha$ ) of 0.05. The hypothesis tested was the null hypothesis ( $H_0$ ), which assumes that the research sample is drawn from a normally distributed population. The criteria for hypothesis acceptance or rejection were as follows: (1) if the obtained significance value is greater than 0.05, the sample is considered to be from a normally distributed population, and (2) if the significance value is less than 0.05, the sample is not from a normally distributed population.

The results of the normality test for the post-test scores of student groups, categorized based on learning models, are presented in the following table.

Table 3.4. Results of Post-Test Data Normality Test Based on Learning Models

Learning Models	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Discovery	.096	30	.200*	.962	30	.340
Problem Based	.073	30	.200*	.990	30	.991

\*. This is a lower bound of the true significance

a. Lilliefors Significance Correction

The results of the Lilliefors Significance Correction test from Kolmogorov-Smirnov indicate that: (1) the significance value for critical thinking in students who received instruction using the Discovery Learning model is  $0.200 > 0.05$ , and (2) the significance value for critical thinking skills in students taught using the Problem Based Learning model is  $0.200 > 0.05$ . Therefore, it can be concluded that the critical thinking skills data for both the Discovery Learning group and the Problem-Based Learning group follow a normal distribution. Additionally, the normality test results for the post-test data, categorized based on students' critical thinking skills (High Self-Efficacy and Low Self-Efficacy), are presented in the following table.

Table 3.5. Results of Post-Test Data Normality Test Based on Self-Efficacy

Self-Efficacy	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
High	.077	35	.200	.982	35	.822
Low	.130	25	.200	.972	35	.697

\*. This is a lower bound of the true significance

a. Lilliefors Significance Correction

The results of the Lilliefors Significance Correction test from Kolmogorov-Smirnov indicated that: (1) the significance value for critical thinking among students with high Self-Efficacy is  $0.822 > 0.05$ , and (2) the significance value for critical thinking among students with low Self-Efficacy is  $0.697 > 0.05$ . Based on these results, it can be concluded that the critical thinking data for both students with high Self-Efficacy and those with low Self-Efficacy follow a normal distribution.

In addition to the normality test, a homogeneity test was conducted to determine whether the variance across different research groups was equal. Homogeneity refers to whether the data sets being analyzed share similar characteristics. This homogeneity test was performed on critical thinking data from students taught using the Discovery Learning model and those taught with the Problem-Based Learning model, including both high and low Self-Efficacy groups. The test was conducted using Levene's test at a significance level ( $\alpha$ ) of 0.05.

The null hypothesis ( $H_0$ ) tested in this case stated that the variances in each group are equal (homogeneous). The criteria for acceptance or rejection of the hypothesis are as follows: (1) if the obtained significance value is greater than 0.05, the variance of each sample is considered equal (homogeneous), and (2) if the obtained significance value is less than 0.05, the variance of each sample is considered unequal (not homogeneous). The complete results of the calculation are presented in the following table.

Table 3.6. Results of the Critical Thinking Data Homogeneity Test with Levene's Tests

Test of Homogeneity of Variance				
	Levene Statistic	df2	Sig.	
Critical Thinking Skills	Based on Mean	0.344	58	0.560

The homogeneity of variance test results, as presented in the table above, indicate that the Levene test for critical thinking data, based on the mean, yields a value of 0.344 with df2 of 58 and a significance level of 0.560. Since the significance level of 0.560 is greater than 0.05, it can be concluded that the critical thinking data is homogeneous. Following the normality and homogeneity tests, the next step is to conduct hypothesis testing. This analysis was performed on the critical thinking data of students who were taught using the Discovery Learning model and those taught using the Problem Based-Learning model, with both groups further categorized based on High and Low Self-Efficacy levels. The primary objective of hypothesis testing is to verify the validity of the proposed hypotheses, which include: (1) The Discovery Learning model had an effect on students' critical thinking, (2) Self-Efficacy influences students' critical thinking, and (3) There was an interaction effect between learning models and Self-Efficacy on students' critical thinking.

The hypothesis testing employs a two-way Analysis of Variance with a 2x2 factorial design. The data was analyzed using the Statistical Package for Social Science (SPSS) software. The results of the analysis regarding the effects between variables are presented in the following table.

Table 3.7. Results of the Test of the Influence of Individual Variables

Tests of Between-Subjects Effects						
Dependent Variable: Critical Thinking						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	648.102a	3	216.034	26.316	.000	
Intercept	420206.226	1	420206.226	51186.729	.000	
Learning Models	225.007	1	225.007	27.409	.000	
Self-Efficacy	384.032	1	384.032	46.780	.000	
Model * Self-Efficacy	42.584	1	42.584	5.187	.027	
Error	429810.170	56	8.209			
Total	429810.170	60				
Corrected Total	1107.822	59				

a. R Squared = .585 (Adjusted R Squared = .563)

The results of the 2x2 ANOVA test on the results of critical thinking skills contained in Table 3.7 show that the F-count value obtained by the Discovery Learning Model for the critical thinking

variable is 26.316 with a probability or significance value of 0.00 < 0.05. It means that there was an influence of the Discovery Learning model on students' critical thinking. The results of the analysis also show that the average critical thinking skills also differ between students who were taught with Discovery Learning and students who were taught with the Problem-Based Learning Model. In Table 3.7 the results of the descriptive statistical analysis showed that there was a difference in the average increase in the critical thinking skills score of students who are treated with Discovery Learning and students who use the Problem Based Learning Model. Students who use Discovery Learning get an average score from pretest to posttest increasing by 21.30, while students who are taught by applying the Problem Based-Learning model get an average score from pretest to posttest increasing by 15.69. The Discovery Learning class gets a higher average score than the Problem-Based Learning Model class (21.30 > 15.69). Thus, it can be concluded that learning using Discovery Learning can improve critical thinking skills more than learning using the Problem-Based Learning model.

Based on Table 3.7, it can also be seen that the F-count value of student Self-Efficacy is 46,780 with a probability or significance value of 0.010 < 0.05. It means that there is an influence of Self-Efficacy on students' critical thinking. In addition, the results of the test of the influence of the interaction between the learning model and Self-Efficacy show that the F-count value for the interaction of the learning model with Self-Efficacy contained in Table 4.9 is 5,187 with a probability or significance value of 0.027 < 0.05. This means that there is an influence of interaction between the learning model and Self-Efficacy on students' critical thinking skills.

### 3.2 Discussion

Based on the results of hypothesis testing in this study, this discussion discusses the influence of Learning Models on critical thinking skills, the influence of Self-Efficacy on Critical thinking skills, and the influence of interaction between learning models and Self-Efficacy on students' critical thinking skills

The hypothesis test results reveal a significant difference in critical thinking skills between students taught using the Discovery Learning model and those taught using the Problem Based model. On average, students in the Discovery Learning group performed better than those in the Problem Based group. The critical thinking skills test data shows that students using Discovery Learning had an average score of 87.89, while students taught with the Problem Based model had an average score of 81.82. This indicates that the Discovery Learning model had a more positive impact compared to the Problem Based model. The hypothesis test results further confirm this, with an F-count value of 27.40 and a significance value of 0.00, which is less than 0.05. This suggests that the learning model significantly influences students' critical thinking skills.

The Discovery Learning Model can build critical thinking skills because the learning model encourages students to actively participate in exploration, analysis, and problem-solving independently. In Discovery Learning, students are faced with open-ended problems or questions that require them to think logically, evaluate information, and formulate solutions. This process trains students to identify problems, understand various perspectives, and determine the best approach. In addition, the Discovery Learning Model develops analytical skills. In this case, students are asked to collect, organize, and evaluate relevant data. This activity trains them to analyze relationships, and cause and effect, this kind of activity encourages the formation of critical thinking skills. In other words, this process involves in-depth analysis, evaluation of information, and synthesis of ideas, all of which strengthen critical thinking skills.

The findings of this study are consistent with several previous research outcomes. Previous studies have shown that the Discovery Learning Model not only enhances critical thinking skills but also improves learning outcomes (Cintia et al., 2018). In a Classroom Action research study, it was

found that the Discovery Learning Model improved students' critical thinking skills, with the pre-cycle score at 38%, rising to 73% in Cycle I and further increasing to 81% in Cycle II. This improvement in critical thinking skills also positively affected student learning outcomes, from 35% in the pre-cycle to 77% in Cycle I and 85% in Cycle II (Prasasti et al., 2019). Other studies have similarly demonstrated that the implementation of the Discovery Learning Model had a significant impact on enhancing students' thinking skills (Prasasti et al., 2019; Laeni & Shelly Efwinda, 2022; Fahmi et al., 2023).

Self-efficacy is another variable that contributes to the development of students' critical thinking skills. The hypothesis test results in this study indicate that the F count value for student self-efficacy is 46.780 with a significance value of 0.010, which is less than 0.05, confirming the influence of self-efficacy on students' critical thinking skills. Self-efficacy plays a key role in how students organize their thoughts and develop strategies to solve problems. Students with higher self-efficacy tend to approach problems more systematically and confidently. In the learning process, self-efficacy helps students to be more engaged, particularly in discussions and problem-solving activities, which are essential for developing critical thinking skills. Students with high self-efficacy are generally more confident in tackling complex problems, further demonstrating the relationship between self-efficacy and critical thinking skills (Aydin Gürler, 2021; Azhar et al., 2022; Vachova et al., 2023).

The results of previous studies have shown that there was an influence of self-efficacy not only on critical thinking skills but also on students' learning motivation (Arjun Yoga Pratama, 2023). Other studies have also shown that there was a significant positive relationship between self-efficacy and critical thinking. This shows that the higher the self-efficacy possessed by students, the more their critical thinking skills will increase (Salea et al., 2022).

Umam explained that students with high self-efficacy showed better critical thinking skills compared to their peers who have lower levels of self-efficacy (Umam et al., 2023). This finding was also found in the study of Yılmaz et al., who found a significant positive relationship between self-efficacy and metacognitive thinking skills, indicating that self-efficacy improves the cognitive processes needed for critical thinking (Karaođlan-Yılmaz et al., 2019).

The Discovery Learning Model with self-efficacy has an interactive effect. The results of the hypothesis test of this study, show that the F-count value for the interaction of the learning model with Self-Efficacy contained in Table 4.9 is 5.187 with a probability or significance value of 0.027 < 0.05. This means that there was an interaction effect between the learning model and self-efficacy on students' critical thinking skills. The factor causing the interaction effect is that the Discovery Learning-based learning design can stimulate the development of students' self-efficacy, which in turn contributes to improving their critical thinking skills (Prasetya, 2022). Another factor that drives the interaction between the Discovery Learning Model and self-efficacy is that Discovery Learning can create an active and interactive learning environment, where students are encouraged to explore and discover information on their own. Discovery Learning model provides opportunities for students to explore and discover information independently. In this context, students are faced with problems that require solving, which encourages them to think critically (Rahmawati et al., 2021). When students are involved in the discovery process, they learn to evaluate information, make inferences, and draw conclusions based on existing evidence. In addition, students who have high levels of self-efficacy tend to be more confident in their ability to complete challenging tasks, including in the context of discovery-based learning.

The ability or success in completing tasks can increase students' self-efficacy, which in turn contributes to improving their critical thinking skills. When students feel capable, they are more likely to engage in discussions, share ideas, and collaborate with classmates, all of which are important elements in developing critical thinking skills (Simamora et al., 2018). The Discovery Learning model can optimize students' critical thinking skills, especially when students are faced with problems that

require creative solutions (Yuniawati & Purba, 2021). Students with high self-efficacy are more inclined to take the lead in their learning process, which significantly enhances the development of their critical thinking abilities. In general, the combination of the Discovery Learning model and self-efficacy forms a powerful synergy that effectively boosts students' critical thinking skills.

#### 4. CONCLUSION

Based on the findings from the research, it can be concluded that: (1) The Discovery learning model has an impact on students' critical thinking. This is supported by the hypothesis testing results obtained through SPSS, which indicate an F-value of 27.409 with a significance level of 0.00, which is less than 0.05. (2) Self-Efficacy also influences students' critical thinking. This is evidenced by the hypothesis testing results from SPSS showing an F-value of 46.780 for Self-Efficacy, with a significance value of 0.010, which is again less than 0.05. (3) Additionally, there is an interaction effect between the Learning Model and Self-Efficacy on students' critical thinking. This is demonstrated by the SPSS analysis results indicating an F-value of 5.187 for the interaction effect, with a significance value of 0.027, which is also less than 0.05.

This study has several limitations. First, this study only focuses on the relationship between learning models, self-efficacy, and critical thinking skills, without considering other factors such as learning motivation, environmental support, or individual differences that could potentially affect the results. Second, the research design used may not fully reflect the long-term dynamics of the influence of learning models on students' critical thinking skills.

For future research, it is recommended to explore interactions with other factors, such as students' learning strategies, level of engagement in learning, and social support. In addition, the use of longitudinal designs can provide a deeper understanding of the long-term impact of learning models on critical thinking skills.

The results of this study can provide insights for educators in designing more effective learning strategies. For example, the application of Problem-Based Learning model can be expanded to improve students' critical thinking skills, while increasing self-efficacy can be supported through a more responsive learning approach and oriented towards strengthening students' academic self-confidence.

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#### REFERENCES

- Akhir, M., Siburian, J., & Effendi, M. H. (2023). A Study Comparison of the Application of Discovery Learning and Problem-Based Learning Models on the Critical Thinking Ability. *Integrated Science Education Journal*, 4(2), 84–89. <https://doi.org/10.37251/isej.v4i2.390>
- Arjun Yoga Pratama. (2023). Pengaruh Self Efficacy Dan Motivasi Belajar Terhadap Kemampuan Berpikir Kritis Matematis Siswa. *Jurnal Riset Pendidikan Matematika Jakarta*, 5(1), 1–9. <https://doi.org/10.21009/jrpmj.v5i1.23021>
- Ary, D. J. L. C., & Razavieh. (2002). *Introduction to Research in Education* (6th ed.). Wadsworth Thomson Learning.

- Aydin Gürler, S. (2021). State of prediction of the critical thinking dispositions of primary school teacher candidates through their self-efficacy for STEM practices. *Participatory Educational Research*, 9(3), 61–81. <https://doi.org/10.17275/per.22.54.9.3>
- Azizah, N. A., Ketut, I., Sudiarditha, R., & Pratama, A. (2022). International Journal of Multidisciplinary Research and Literature the Influence Of Emotional Intelligence And Self Efficacy On Students Critical Thinking Skills In Class Xi Ips At Sman 41 Jakarta. *International Journal of Multidisciplinary Research and Literature IJOMRAL*, 1(6), 620–740. <https://doi.org/10.53067/ijomral.v1i6>
- Barli Sihombing, R., Solihat, E., & Sudrajat, A. (2018). The Effect of Cooperative Learning Models and Self Efficacy to Critical Thinking Ability on Social Studies. *International Journal of Advances in Scientific Research and Engineering*, 4(7), 89–96. <https://doi.org/10.31695/ijasre.2018.32796>
- Bruce W. Tuckman. (1999). *Conducting Educational Research Fifth Edition*. In *Harcourt Brace College Publishers*.
- Capron Puozzo, I., & Audrin, C. (2021). Improving self-efficacy and creative self-efficacy to foster creativity and learning in schools. *Thinking Skills and Creativity*, 42(October), 100966. <https://doi.org/10.1016/j.tsc.2021.100966>
- Cintia, N. I., Kristin, F., & Anugraheni, I. (2018). Penerapan Model Pembelajaran Discovery Learning Untuk Meningkatkan Kemampuan Berpikir Kreatif dan Hasil Belajar Siswa. *Perspektif Ilmu Pendidikan*, 32(1), 67–75. <https://doi.org/10.21009/pip.321.8>
- Cohen, L., Manion, L., and Morrison, K. (2018). *Research Methods in Education 8th Edition*. In *Routledge* (Vol. 4, Issue 1).
- Dehghani, M., Sani, H. J., Pakmehr, H., & Malekzadeh, A. (2011). Relationship between students' critical thinking and self-efficacy beliefs in Ferdowsi University of Mashhad, Iran. *Procedia - Social and Behavioral Sciences*, 15, 2952–2955. <https://doi.org/10.1016/j.sbspro.2011.04.221>
- Dekker, T. J. (2020). Teaching critical thinking through engagement with multiplicity. *Thinking Skills and Creativity*, 37(May), 100701. <https://doi.org/10.1016/j.tsc.2020.100701>
- Dyamayanti, L., Fatimah, S., Lestari, I. D., & Kurniawan, D. (2023). The Effect of Discovery Learning Model on Students' Learning Outcomes on the Protists Concept. *Jurnal Pendidikan Indonesia Gemilang*, 3(1), 15–19. <https://doi.org/10.52889/jpig.v3i1.152>
- Fahmi, N., Soekamto, H., & Deffinika, I. (2023). Pengaruh model discovery berbantuan media audio visual terhadap kemampuan berpikir kritis ditinjau dari minat belajar siswa. *Jurnal Integrasi Dan Harmoni Inovatif Ilmu-Ilmu Sosial*, 3(10), 1081–1097. <https://doi.org/10.17977/um063v3i10p1081-1097>
- Hirai, A., Oka, H., Kato, T., & Maeda, H. (2022). Development and validation of an English test measuring EFL learners' critical thinking skills. *Language Testing in Asia*, 12(1). <https://doi.org/10.1186/s40468-022-00193-2>
- Huamán-Tapia, E., Almanza-Cabe, R. B., Sairitupa-Sanchez, L. Z., Morales-García, S. B., Rivera-Lozada, O., Flores-Paredes, A., & Morales-García, W. C. (2023). Critical Thinking, Generalized Anxiety in Satisfaction with Studies: The Mediating Role of Academic Self-Efficacy in Medical Students. *Behavioral Sciences*, 13(8). <https://doi.org/10.3390/bs13080665>

- Karaođlan-Yilmaz, F. G., Yilmaz, R., Üstün, A. B., & Keser, H. (2019). Öğretmen Adaylarının Üstbilışsel Düşünme Becerilerinin Yordayıcısı Olarak Eleřtirel Düşünme Standartları ve Akademik Öz-Yeterliklerinin Yapısal Eřitlik Modellemesi Yoluyla İncelenmesi. *Kuramsal Eđitimbilim*, 12(4), 1239–1256. <https://doi.org/10.30831/akuveg.467435>
- Laeni, S., & Shelly Efwinda, dan. (2022). *Pengaruh Model Discovery Learning terhadap Kemampuan Berpikir Kritis Siswa SMA Negeri 13 Samarinda Materi Impuls dan Momentum*. <http://jurnal.fkip.unmul.ac.id/index.php/JLPF>
- Martaıda, T., Bukit, N., & Ginting, E. M. (2017). The Effect of Discovery Learning Model on Student's Critical Thinking and Cognitive Ability in Junior High School. *IOSR Journal of Research & Method in Education (IOSR-JRME)* e-ISSN: 2320-7388,p-ISSN: 2320-737X Volume 7, Issue 6 Ver. 1 (Nov. – Dec. 2017), PP 01-08 *Www.Iosrjournals.Org*, 7(6), 1–8. <https://doi.org/10.9790/7388-0706010108>
- Mustikaningrum, G., & Mediatati, N. (2021). Application of The Discovery Learning Model Assisted by Google Meet to Improve Students' Critical Thinking Skills and Science Learning Outcomes. *International Journal of Elementary Education*, 5(1), 30–38. <https://ejournal.undiksha.ac.id/index.php/IJEE>
- Nugraha, T., Samrotul Fuadah, U., & Amalia, A. (2020). Indonesian Journal of Primary Education Discovery Learning Application Using a Rope (Track A Line Idea) to Detect Critical Thinking Skills on Elementary School Students. © 2020-*Indonesian Journal of Primary Education*, 4(2), 132–140. <http://ejournal.upi.edu/index.php/IJPE/index>
- Prahani, B. K., Jatmiko, B., Pristanti, M. C., Satriawan, M., Amelia, T., & Makahinda, T. (2023). The dHOTLearn Model to Improve Critical Thinking Skills of Physics Education Program Undergraduate. *Journal of Higher Education Theory and Practice*, 23(19), 113–124. <https://doi.org/10.33423/jhetp.v23i19.6676>
- Prasasti, D. E., Dewi Koeswanti, H., & Giarti, S. (2019). *Peningkatan Keterampilan Berpikir Kritis Dan Hasil Belajar Matematika Melalui Model Discovery Learning di Kelas IV SD* (Vol. 3, Issue 1). <https://jbasic.org/index.php/basicedu>
- Prasetya, A. E. (2022). Desain Pembelajaran Berbasis Discovery Learning untuk Meningkatkan Self Efficacy Siswa Sekolah Dasar. *JURNAL SYNTAX IMPERATIF : Jurnal Ilmu Sosial Dan Pendidikan*, 3(3), 218. <https://doi.org/10.36418/syntax-imperatif.v3i3.170>
- Rahmadhani, S., Yunisrul, Y., & Helsa, Y. (2020). Discovery Learning Model in Integrated Thematic Learning for Elementary School Students. *Tunjuk Ajar: Jurnal Penelitian Ilmu Pendidikan*, 2(2), 202–209. <https://doi.org/http://dx.doi.org/10.31258/jta.v3i2.202-209>
- Rahmawati, S., Masykuri, M., & Sarwanto, S. (2021). The effectiveness of discovery learning module classification of materials and its changes to enhance critical thinking skills. *Jurnal Inovasi Pendidikan IPA*, 7(1). <https://doi.org/10.21831/jipi.v7i1.33253>
- Ramadhani, A. W., Maryani, I., & Vehachart, R. (2022). Literature Study on Self-Regulated Learning in Science Learning of Elementary School Students. *International Journal of Learning Reformation in Elementary Education*, 1(02), 80–100. <https://doi.org/10.56741/ijlree.v1i02.71>
- Rizki, A., Khaldun, I., & Pada, A. U. T. (2021). Development of Discovery Learning Student Worksheets to Improve Students' Critical Thinking Skills in Chemical Balance Materials. *Jurnal Penelitian Pendidikan IPA*, 7(4), 707–711. <https://doi.org/10.29303/jppipa.v7i4.829>

- Ruslan, D., Sari, P., Silaban, M. J., Teviana, T., & Irawan, D. (2021). *Innovation Development of Microeconomics E-Module Based on Discovery Learning on Utility Functions*.
- Saepuloh, D., Sabur, A., Lestari, S., & Mukhlisoh, S. U. (2021). Improving Students' Critical Thinking and Self-Efficacy by Learning Higher Order Thinking Skills Through Problem-Based Learning Models. *JPI (Jurnal Pendidikan Indonesia)*, 10(3), 495. <https://doi.org/10.23887/jpi-undiksha.v10i3.31029>
- Salea, N., Soetjningsih, C. H., Kristen, U., & Wacana, S. (2022). JIBK UNDIKSHA Hubungan Self-efficacy dengan Critical Thinking pada Mahasiswa. *Jurnal Ilmiah Bimbingan Konseling Undiksha*, 13, pp XX-XX. <https://doi.org/10.23887/XXXXXX-XX-0000-00>
- Simamora, R. E., Saragih, S., & Hasratuddin, H. (2018). Improving Students' Mathematical Problem Solving Ability and Self-Efficacy through Guided Discovery Learning in Local Culture Context. *International Electronic Journal of Mathematics Education*, 14(1). <https://doi.org/10.12973/iejme/3966>
- Siregar, N. C., Rosli, R., & Maat, S. M. (2020). The effects of a discovery learning module on geometry for improving students' mathematical reasoning skills, communication and self-confidence. *International Journal of Learning, Teaching and Educational Research*, 19(3), 214–228. <https://doi.org/10.26803/ijlter.19.3.12>
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. CV Alfabeta.
- Suwardi, E., Rusilowati, A., & Wardani, S. (2022). The Effectiveness of Application Discovery Learning Model of Multiple Intelligences-Based on Science Critical Thinking Skills in Grade V Elementary School Students in Buton Regency. *International Journal of Research and Review*, 9(2), 261–273. <https://doi.org/10.52403/ijr.20220236>
- Umam, I. U., Nurlaelah, E., & Suhendra, S. (2023). Mathematical Critical Thinking Ability Based on Student's Self-Efficacy Using Phenomenological Study Approach. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, 12(2), 2676. <https://doi.org/10.24127/ajpm.v12i2.6859>
- Vachova, L., Sedlakova, E., & Kvintova, J. (2023). Academic Self-efficacy as a Precondition for Critical Thinking in University Students. *Pegem Egitim ve Ogretim Dergisi*, 13(2), 328–334. <https://doi.org/10.47750/pegegog.13.02.36>
- Waddington, J. (2023). Self-efficacy. *ELT Journal*, 77(2), 237–240. <https://doi.org/10.1093/elt/ccac046>
- Wafa, Z., & Jatmiko, B. (2022). Learning Physics with a Free Discovery Model to Improve Critical Thinking Skills of High School Students. *Prisma Sains : Jurnal Pengkajian Ilmu Dan Pembelajaran Matematika Dan IPA IKIP Mataram*, 10(3), 637. <https://doi.org/10.33394/jps.v10i3.5375>
- Yaldiz, N., & Bailey, M. (2019). The Effect of Critical Thinking on Making the Right Decisions in the New Venture Process. *Procedia Computer Science*, 158, 281–286. <https://doi.org/10.1016/j.procs.2019.09.053>
- Yuniawati, T. L., & Purba, F. J. (2021). Discovery learning model to optimize students' critical thinking skills on hydrocarbon material. *Jurnal Pendidikan Kimia*, 13(3), 269–277. <https://doi.org/10.24114/jpkim.v13i3.30208>

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