



The Influence of Critical Thinking Skills and Inquiry Skills on the Biosolar Innovation Ability of Class X Students TKR Skills Competency at SMKN 1 Jiwana

Yoni Dwi Lestari ^{a,1*}, Rina Harimurti ^{a,2}, Warju ^{a,3}, Lilik Anifah ^{a,4}, I Gusti Putu Asto Buditjahjanto ^{a,5}

^a Universitas Negeri Surabaya, Indonesia

¹ yonedq@gmail.com, ² rinaharimurti@unesa.ac.id, ³ warju@unesa.ac.id, ⁴ lilikanifah@unesa.ac.id,

⁵ asto@unesa.ac.id

* corresponding author

Article Information

Article History:

Received : December 2024

Accepted : January 2025

Published : February 2025

Keywords:

Critical Thinking Skill;

Inquiry Skills;

Biosolar Innovation Abilities.

How to Cite:

Lestari, Y. D. (2025). The Influence of Critical Thinking Skills and Inquiry Skills on the Biosolar Innovation Ability of Class X Students TKR Skills Competency at SMKN 1 Jiwana. *Jurnal Dimensi Pendidikan dan Pembelajaran Universitas Muhammadiyah Ponorogo*, 13 *Special Issue*(1), pp50-61.

Abstract

Critical thinking skills and inquiry skills are necessary for vocational school students to stimulate innovation abilities because vocational school graduates are prepared to immediately enter the world of work or create their jobs. The research goal is to analyze the influence of critical thinking skills and inquiry skills on the biosolar innovation abilities of class Light Vehicle Engineering students. It is a descriptive type of research that applies a quantitative method. It uses an ex-post de facto design. The population in this study was class X TKR skill competency students at SMK Negeri 1 Jiwana, totaling 129 students. With a sample size of 98 students. This study used a simple random sampling technique. The measuring instrument used is a questionnaire with multiple linear regression analysis as the data analyzing technique. The results show that there is a significant partial and simultaneous influence of the critical thinking skills and inquiry skills variables on the biosolar innovation abilities of the class. The suggestion from this research is that schools are expected to be able to adopt policies that can stimulate students' biosolar innovation abilities which are influenced by critical thinking skills and inquiry skills.

INTRODUCTION

As a formal secondary level education institution, Vocational High Schools (SMK) aim to prepare students to become quality graduates, all set to work and able to adapt to the work place.

Therefore, vocational education institutions should have a curriculum that can support this main goal. It is supported by Republic of Indonesia Government Regulation no. 29 of 1990 about Secondary Education article 3 paragraph 2, “Vocational High Schools prioritize preparing students to enter the workforce and developing professional attitudes”. But as of right now, there is still a problem that has to be solved: vocational school graduates' inability to integrate into the workforce. According to BPS (Central Statistics Agency) 2022 the unemployment rate in Indonesia in August 2022 was 5.86% or 8.42 million people. Vocational school graduates were recorded as contributing the most at 9.42% (BPS, 2022). Vocational school graduate students often experience difficulties and tend to be frustrated in getting jobs that suit their field of expertise. The view that they are too young and do not have enough knowledge and skills often becomes a barrier to them getting a decent job (Aditya, 2021).

Developing the innovation abilities of vocational school students can help solve this problem. Innovation is an idea, item, method, method or man-made product that is seen or considered new by an individual or group of society (Ridha, 2021). It is necessary for vocational school students to possess innovation abilities. This is necessary to prepare vocational school graduates to meet the needs of the world of business and industry (DUDI), as well as to become entrepreneurs and compete with DUDI and even surpass it.

Making biosolar, an alternative fuel, is one of the innovations that vocational school students can carry out. Biosolar is a vegetable oil fuel (BBN) made by transesterification and esterification of vegetable oils. Biosolar raw materials consist of various types of materials, including castor oil, waste cooking oil, and coconut oil (Ponidi dan Rohman, 2021). Vocational high school (SMK) students can develop biosolar to improve their innovation abilities. They can also commit to producing new renewable energy and reducing the use of solar energy. To form students' innovation abilities, students must be equipped with abilities such as being positive, thinking critically, practically, and logically, and having a creative spirit. Critical thinking ability is a person's attempt to gain deeper knowledge. Critical thinking is a process that is carried out actively, systematically, and considers various points of view to understand and process information to determine whether the judgment can be accepted, suspended, or rejected and whether it can adhere to logical principles, be suspended, or rejected (Nuridayah et al., 2023).

Critical thinking skills can hone thinking abilities. Students are required to think deeper and further in the educational process, of course, this has a good impact on creating student creativity. According to Cahyani and Putri (2020), learning that emphasizes critical thinking skills has several benefits, such as learning is more economical, which means that the lessons and knowledge taught will remain in the minds of students, tends to increase the enthusiasm for learning and enthusiasm of teachers and students, it is hoped that students will have a scientific attitude, and can solve problems while studying in class and outside the classroom. However, it should be remembered that critical thinking skills are not enough to improve students' innovation abilities. Students should be taught systematic thinking skills that help them turn problems into new ideas. To solve problems, one must be able to observe, analyze, hypothesize, predict, assemble, measure, and make conclusions. This skill is known as inquiry skills. According to Bulan et.al. (2020), the capacity to formulate issues, develop hypotheses, organize and conduct investigations, and draw findings for explanation is known as inquiry skill.

Based on preliminary research carried out in class X TKR 2 SMK Negeri 1 Jiwan on December 3rd, 2024 that applied the questionnaire method, found that 2 students (6%) have a good category on critical thinking skills, 13 students (43.4%) have critical thinking skills in the medium category and 15 (50%) students are in the poor category. The results of initial research on inquiry skills showed that out of 30 students, only 1 student (3.3%) had inquiry skills in the good category, 9 students (30%) in the medium category and 20 students (66.4%) in the poor category. The

results of initial research on biosolar innovation capabilities showed that out of 30 students, there were 4 students (13.3%) in the good category, 11 students (36.6%) in the sufficient category and 15 (50%) students in the poor category.

Based on the results of preliminary research on 30 students, identified that the lack of students' biosolar innovation abilities is also accompanied by the majority of students who also lack understanding of biosolar theory, critical thinking skills and inquiry skills. This condition requires attention from the school, because vocational school graduates are prepared to immediately enter the world of work or create their own jobs. By having biosolar innovation capabilities, vocational school students can contribute to the availability of alternative energy while creating their own world of work when they graduate from school. This research aims to analyze the influence of critical thinking skills and inquiry skills on the biosolar innovation abilities of class X students TKR skill competence of SMKN 1 Jiwan.

LITERATURE REVIEW

Critical Thinking Skills

According to Sugono (2008), thinking means using reason to consider and decide something, considering it in memory. Meanwhile, critical is (1) the nature of not being able to believe quickly, (2) the nature of always trying to find mistakes or mistakes; sharp in analysis. Critical thinking is an activity carried out by someone in collecting, categorizing, analyzing and evaluating information to make conclusions that are used to solve problems. According to Zakiah and Lestari (2019), one cognitive technique for resolving more complicated issues that call for higher patterns is critical thinking. While, Nhat et al. (2019) said that reasonable and thoughtful reasoning aimed at determining what to believe or do is known as critical thinking.

From those theories, it can be concluded that the ability to analyze, synthesize, make decisions, create, and apply new knowledge in real-world contexts is known as critical thinking abilities, and in this case, it is used in the learning process. According to Sudrajat et.al. (2021), critical thinking of an individual can be monitored by several indicators. The indicators of critical thinking skills are:

1. Provide a simple explanation
2. Create basic abilities
3. Draw up temporary conclusions/inferences
4. Prepare further explanations
5. Determine strategy and tactics

Inquiry Skills

The common English word "inquiry" means "question" or "investigation." A set of abilities known as inquiry skills maximizes each student's capacity to seek and investigate methodically, critically, rationally, and analytically so that they can confidently establish their conclusions (Nasution, 2017).

Karmila et.al. (2020) said that inquiry skills is the capacity to formulate problems, formulate hypotheses, plan investigations, conduct investigations, and draw conclusions for explanation. Inquiry skills are the ability to gather data through experimentation or observation to solve a problem using critical and logical thinking abilities. These stages include formulating hypotheses, designing experiments, gathering data, analyzing data, answering questions, and drawing conclusions. According to Sumarlina et.al. (2020), inquiry skill indicators are consist of:

1. Ask or formulate a problem
2. Make a hypothesis
3. Collect data

4. Analyze data
5. Make conclusions
6. Deliver results

Biosolar Innovation Ability

The term "able" denotes "power to do something," and "ability" indicates "skill, strength"(Sugono, 2008). Ability means the capacity of an individual to perform a variety of tasks in a job (Anni dan Rifa'i, 2011). Meanwhile, Innovation is any change that uses creativity to produce new goods, services, concepts, or procedures that are either developed within or externally to the company (Cahyani and Putri, 2020). According to Santoso (2019), innovation capability is the ability to bring new knowledge or technology to develop new products. According to Martinez in Mudlofir and Rusydiyah (2017) innovation ability is the ability to produce new ideas and knowledge to gain profits and market opportunities. Biosolar innovation ability indicators, according to Jong and Hartog, in Darmarini et.al. (2024) consist of:

1. Willingness to change
2. Ability to try new things
3. Ability to produce new processes

METHODS

This study employs quantitative methods and is descriptive in nature. It employs an ex-post de facto design, which is a methodical empirical investigation in which the researcher does not directly control the independent. It was carried out at SMK Negeri 1 Jiwan which is addressed at Jl. Kh. Ahmad Dahlan No. 63161, Pojokjakas, Wayut, Kec. Jiwan, Madiun Regency, East Java in November 2024. The population in this study was class X TKR skill competency students at SMK Negeri 1 Jiwan, totaling 129 students. Based on calculations using the Slovin formula, the number of samples in this study was 98 students with simple random sampling as a sampling technique.

The variables in this research consist of Critical Thinking Skills (X1) and Inquiry Skills (X2) as independent variables and Biosolar Innovation Ability (Y) as the dependent variable. The measuring tools are questionnaires. The research data was analyzed using multiple linear regression analysis tests.

RESULTS AND DISCUSSION

This study examines the influence of critical thinking skills and inquiry skills on the biosolar innovation abilities of class X TKR skill competence SMKN 1 Jiwan. Based on research data obtained through questionnaires, the characteristics of research respondents are known as follows:

Table 1. Respondents Characteristics

Characteristics	Frequence	Percentage (%)
Gender		
Male	98	100
Female	0	0
Total	98	100
Age		
<15 years	10	10,2
15 years	41	41,8
16 years	47	48,0
Total	98	100,0
Parents' Educational Background		
Elementary	5	5,1
Junior High School	21	21,4
Senior High School	48	49,0
Academi/ Diploma	19	19,4
College	5	5,1
Total	98	100,0
Parent's Job		
Civil servants	6	6,1
Soldier/Police	9	9,2
Self-employed	31	31,6
Private employees	26	26,5
Farmer	11	11,2
Teacher	4	4,1
Housewife	6	6,1
Retired	3	3,1
Others	2	2,0
Total	98	100,0

The results of the frequency distribution of respondent characteristics in the gender section show that all respondents (98 people or 100%) are male. The results of the frequency distribution regarding age showed that the majority of respondents, 47 people (48.0%) were 16 years old. Meanwhile, the results of the frequency distribution of the respondents' parents' education, the majority had an educational background of high school graduates/equivalent, as many as 48 people (49.0%). Meanwhile, the characteristics of respondents based on their parents' jobs showed that the majority worked as entrepreneurs, 31 people (31.6%). The results of research variables based on the questionnaire obtained the following data:

Table 2. Frequency Distribution of Research Variables

Variable	Frequence	Percentage (%)
Critical Thinking Skills (X1)		
Less	1	1,0
Adequate	40	40,8
Good	57	58,2
Total	98	100
Inquiry Skills (X2)		
Less	2	2,0
Adequate	28	28,6
Good	68	69,4
Total	98	100,0
Biosolar Innovation Ability (Y)		
Less	1	1,0

Variable	Frequence	Percentage (%)
Adequate	48	49,0
Good	49	50,0
Total	98	100,0

Multiple linear regression analysis with SPSS 25.0 is the test instrument utilized in this study to evaluate the hypothesis. The classical assumption test is performed first to test multiple linear regression analysis. The classical assumption test is a statistical analysis procedure that requires the fulfillment of basic assumptions regarding the distribution of data on the variables used. This is also to form an estimate that is Best, Linear, Unbiased, and Estimator Sarwono, 2016). The first classical assumption test is the multicollinearity test to test whether there is a correlation between variables or not in a regression model (Sugiyono, 2017). The results of the multicollinearity test are as follows:

Table 3. Multicolinierity Test Result
Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	4.949	2.929		1.690	.094		
1 Keterampilan_Berpikir_kritis	.246	.112	.203	2.196	.031	.659	1.517
Keterampilan_Inkuiri	.532	.090	.545	5.912	.000	.659	1.517

a. Dependent Variable: Kemampuan_Inovasi_Biosolar

According to the aforementioned multicollinearity test results, the VIF value is $1.517 < 10.00$ and the tolerance value is $0.659 > 0.10$. Therefore, it may be concluded that there are no signs of multicollinearity in the regression model, and testing can proceed to the following phase. The heteroscedasticity test, the next traditional assumption test, looks for differences in variance between the residuals of one observation and the residuals of another observation in a regression model (Sarwono, 2016). The heteroscedasticity test result are as follows:

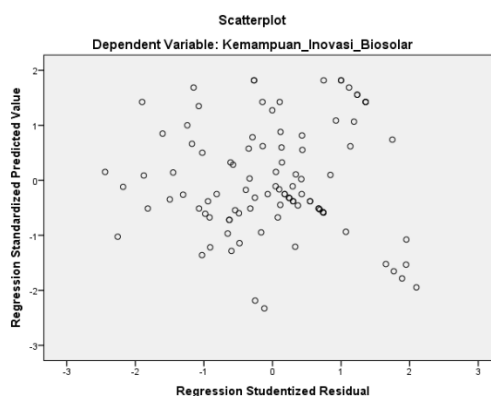


Figure 1. Heteroscedasticity Test Result

Based on the results of the heteroscedasticity test, it can be seen that the data points are spread above and below or around the number 0, the points do not gather only above or below, the distribution of data points does not form a wavy pattern, and the distribution of data points is not patterned. With the criteria for points representing the research data, the research data is considered to have met the requirements and is said to have no symptoms of heteroscedasticity and can be continued at the next stage.

The normalcy test is the final traditional assumption test. The purpose of the normality test is to ascertain if the distribution of research data follows a normal pattern (Siyoto and Sodik, 2015). A good regression model should have a normal pattern of data normality. It uses the One-Sample Kolmogorov-Smirnov normality test. The normality test results from this research are as follows:

		Unstandardized Residual
N		98
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	4.01599665
	Absolute	.049
Most Extreme Differences	Positive	.039
	Negative	-.049
Kolmogorov-Smirnov Z		.486
Asymp. Sig. (2-tailed)		.972

a. Test distribution is Normal.
b. Calculated from data.

Figure 2. Table Normality Test Result

Based on the results in Figure 2, the significance value is $0.972 > 0.05$, as shown in the above table. Thus, the research data might be considered to be regularly distributed. Following the completion of the classic assumption test analysis, multiple linear regression analysis tests are used to assess hypotheses. In this analysis, the partial and simultaneous influence of inquiry skills and critical thinking skills factors on the biosolar innovation abilities of class X TKR skill competence of SMKN 1 Jiwan must be ascertained. The following are the multiple linear regression analysis test results:

Table 4. Multiple Linier Regression Test Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	4.949	2.929		1.690	.094
1	Keterampilan_Berpikir_kritis	.246	.112	.203	2.196	.031
	Keterampilan_Inkuiri	.532	.090	.545	5.912	.000

a. Dependent Variable: Kemampuan_Inovasi_Biosolar

Based on Table 4. which is the result of multiple linear regression analysis, the following equation is obtained:

$$Y = 4,949 + 0,246X_1 + 0,532X_2 \dots\dots\dots(1)$$

X1: Critical Thinking Skills

X2: Inquiry Skills

The regression equation above can be explained as follows:

- A constant of 4.949 indicates that if there is no influence of Critical Thinking Skills (X1) and Inquiry Skills (X2) on Biosolar Innovation Capability (Y), then the Biosolar Innovation Capability Variable value is 4.949.
- The Critical Thinking Skills variable (X1) has a value of 0.246, it indicates that every increase in Critical Thinking Skills (X1) by 1%, the Biosolar Innovation Capability (Y) will raise up by 25.6% assuming the other variables remain constant.
- The Inquiry Skills variable (X2) has a value of 0.532, which indicates that with every increase in Inquiry Skills (X2) by 1%, the Biosolar Innovation Capability (Y) will rise up by 53.2% assuming the other variables remain constant.

The results of the t-test or partial test based on the table data above show that the Critical Thinking Skills variable (X1) has a significance probability value of 0.031. If t is significant, it is smaller than α (0.05), then the hypothesis is accepted. This means that there is a partial influence of critical thinking skills on the biosolar innovation abilities of the class. This is supported by the results of the frequency distribution of research variables which show that in the Critical Thinking Skills variable (X1) the majority are in the good category with 57 respondents (58.2%).

Critical thinking skills are one of the factors that support learning success (Nhat et al., 2019). Many people think that one of the characteristics of a smart person is being able to think critically. These critical thinking skills do not just happen but are influenced by several factors, one of which is learning at school. According to Sukmayadi et al. (2024) in their research stated that the teaching methods used in learning have an impact which is significant for the development of critical thinking in students. The use of interactive and collaborative learning methods has been proven to improve student's critical thinking skills.

Interesting learning methods can provide special learning experiences for students so that students feel enthusiastic about learning and can stimulate students' skills. According to Trianggono et al. (2022) in his research explains that learning experience is one thing a series of activities that can increase cognitive, psychomotor, and affective insight for students. An educator who can provide students with a good learning experience will be able to equip students' ability to think critically. thinking), working together (collaborative), communication skills, and creative and innovative thinking (creative/innovative). A student who is accustomed to thinking critically will be able to study problems systematically, meet many challenges in an organized way, formulate innovative questions, and design original solutions.

The results of this study are supported by research Hariani (2021) about critical and creative thinking abilities. The results of this research state that critical thinking skills have a positive and significant effect on problem-solving abilities. Critical thinking skills are very important for students because with these skills students can act rationally and choose the best alternative options for themselves. Apart from that, it is necessary to instill critical thinking habits in students so that they can pay close attention to various problems that occur in everyday life. From here, students will form their innovation abilities which come from solving various problems they face.

The results of the t test or partial Inquiry Skills variable (X2) have a significance probability value of 0.000. If t is significant, it is smaller than α (0.05), then the hypothesis is accepted. This means that there is a partial influence of inquiry skills on the biosolar innovation abilities of class. The results of this test are supported by data on the frequency distribution of the Inquiry Skills variable (X2) where the majority are in the good category, 68 respondents (69.4%).

According to Sanjaya in Bulan et al. (2020), inquiry skills are a series of skills that emphasize the process of thinking critically and analytically to search for and find answers to a problem in question. Inquiry skills are built on the assumption that from birth humans have the urge to discover their own knowledge. Curiosity about the natural conditions around him has been natural since he was born into the world, through his sense of sight, hearing and other senses. Human curiosity continues to develop into adulthood by using their brain and thoughts. The knowledge he has will become meaningful when it is based on this curiosity.

Widodo et al. (2024) in his research stated that inquiry in English means question, inquiry/examination. Inquiry Skill is a student skill that has the ability to ask questions, investigate/examine something. Inquiry skills are needed to develop students' intellectual abilities. In learning activities, the teacher will stimulate students' inquiry skills by using methods in the form of presenting lessons that give students the opportunity to find information without the help of the teacher. This method involves students in various processes so that students have the ability to innovate.

The research results are supported by Fatmawati and Rustaman (2020) in his research on inquiry skills explains that inquiry skills are more effective in solving a problem because they are more systematic, using thinking skills to plan, implement, evaluate and report. Inquiry skills enable students to solve problems through investigative activities that improve skills and knowledge independently. By having inquiry skills, it provides students with the opportunity to practice skills directly, experiment, ask questions and develop responses based on reasons with the aim of helping students to develop intellectual and disciplined thinking skills by asking questions and receiving answers based on curiosity. The results of the third hypothesis analysis in this research can be seen in the F test results in the following table.

Table 5. F Test Result
ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1372.623	2	686.311	41.676	.000 ^b
	Residual	1564.438	95	16.468		
	Total	2937.061	97			

a. Dependent Variable: Kemampuan_Inovasi_Biosolar

b. Predictors: (Constant), Keterampilan_Inkuiiri, Keterampilan_Berpikir_kritis

Based on the F test results in table 5, it is known that the calculated F value is 41.676 with a significance value of 0.000. So it can be said that there are a significant simultaneous influence of the critical thinking skills and inquiry skills variables on the biosolar innovation abilities of class One piece of evidence that the critical thinking skills and inquiry skills variables have a joint influence on innovation ability is the results of the frequency distribution of the biosolar innovation ability variable, the majority of which were in the good category, 49 respondents (50.0%).

According to Martinez in Mudlofir and Rusydiyah (2017) innovation ability is the ability to produce new ideas and knowledge to gain profits and market opportunities. According to Purwanto (2014), The factors that influence an individual's innovation ability are internal factors which come from within the individual, and external factors which are factors that come from outside the individual, in the form of environmental conditions where the individual goes to school, work, environmental conditions, and culture. Critical thinking skills and inquiry skills are some of the factors that originate from within the individual that influence the biosolar innovation abilities of SMKN 1 Jiwan students.

According to Novitasari et al. (2024), critical thinking skills enable students to see problems from different points of view, and students can come up with new ideas or something innovative to formulate a solution to a problem. Critical thinking involves the stages of analyzing a problem in more detail to obtain deeper results. This critical thinking ability stimulates students at SMK Negeri 1 Jiwan to be able to make environmentally friendly alternative fuel called biosolar. Critical thinking skills in students, which are supported by inquiry skills, enable students' ability to create new things to be implemented systematically because inquiry skills enable students to formulate problems and find solutions based on scientific methods.

According to Purnamasari et al. (2022), *creativity* or creative thinking is a competency that encourages students to be able to produce work that is in line with current developments while still paying attention to aspects of usability and usefulness. While, according to Maylia et al. (2024), Inquiry skills are understood as problem-solving skills that use systematic steps such as orientation, problem formulation, hypothesis submission, data collection through experimentation, hypothesis testing, and concluding. These steps enable students to find the answers to the problems they face. The results of testing the coefficient of determination in this research obtained the following results

Table 6. Coefficient Determination Results
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.684 ^a	.467	.456	4.058

a. Predictors: (Constant), Keterampilan_Inkuiri, Keterampilan_Berpikir_kritis

Based on Table 6, it can be seen that the Adjusted R Square value is 0.456. So it can be interpreted that the ability of the variable's Critical Thinking Skills and Inquiry Skills to explain their influence on Biosolar Innovation Capability is 0.456 or 45.6%. Meanwhile, the remaining 54.4% is influenced by other variables outside the research that has been conducted.

Inquiry skills need to be instilled in vocational school students, especially students majoring in Light Vehicle Engineering (TKR). Inquiry skills that emphasize critical and analytical thinking processes encourage students to have the ability to innovate to produce new things, including producing biosolar fuel. Vocational school graduates who are trained to have innovation skills will be more easily accepted in the world of work because they have breakthroughs that can benefit the place where they work.

CONCLUSION

Based on the results of the analysis and discussion of this research, it can be concluded that: (1) there is a partial influence of critical thinking skills on the biosolar innovation abilities of class X TKR Skill Competence SMKN 1 Jiwan; (2) there is a partial influence of inquiry skills on the biosolar innovation abilities of class X TKR Skill Competence SMKN 1 Jiwan; (3) there is a significant simultaneous influence of the critical thinking skills and inquiry skills variables on the biosolar innovation abilities of class X TKR Skill Competence SMKN 1 Jiwan. The suggestion from this research is that schools are expected to be able to adopt policies that can stimulate students' biosolar innovation abilities which are influenced by critical thinking skills and inquiry skills.

REFERENCES

- Aditya. (2021). Hubungan Konsep Diri dan Kemandirian Belajar dengan Kesiapan Kerja Siswa Kelas XI SMK Negeri 2 Pengasih. *Jurnal Nozel*, 03(o2), 47–59.
- Anni, C. T., & Rifa'i, A. (2011). *Psikologi Pendidikan*. UNNES Press.
- BPS. (2022). *Keadaan Ketenagakerjaan Indonesia Agustus 2022* (Issue 82).
- Bulan, S. N., Maharta, N., & Ertikanto, C. (2020). Pengaruh Kemampuan Inkuiri Terhadap Hasil Belajar Siswa. *Jurnal Pembelajaran Fisika*, 3(3), 109–122. <http://jurnal.fkip.unila.ac.id/index.php/JPF/article/view/8620>
- Cahyani, A., & Putri, S. O. (2020). Inovasi Pendidikan Melalui Kemampuan Berpikir Kritis. *Prosiding Seminar Nasional Pendidikan FKIP*, 2(1), 286–297.
- Darmarini, A. R., Sumartik, & Firdaus, V. (2024). Pengaruh Self Efficacy Individual Innovation Capability dan Knowledge Sharing Terhadap Kinerja Karyawan. *Jurnal Pendidikan Ekonomi*, 12(2), 288–296.
- Fatmawati, B., & Rustaman. (2020). The Study of Inquiry Ability in the Photosynthesis Concept. *Jurnal Pendidikan IPA Indonesia*, 9(4), 583–589. <https://doi.org/10.15294/jpii.v9i4.23989>
- Hariani. (2021). Pengaruh Kemampuan Berpikir Kritis dan Berpikir Kreatif Terhadap Kemampuan Pemecahan Masalah Siswa Kelas XII MIA SMA Negeri 1 Tinambung.

Pedamath, 4(1), 10–19.

- Karmila, D. D., Supeno, & Subiki. (2020). Keterampilan Inkuiri Siswa SMA dalam Model Pembelajaran Inkuiri Berbantuan Virtual Laboratory. *Jurnal Pembelajaran Fisika*, 8(3), 151–158.
- Maylia, E. C., Amelia, A. P., Suwarna, D. M., & Muyassaroh, I. (2024). Strategi Pembelajaran Inkuiri Terhadap Kemampuan Berpikir Kritis Siswa. *Jurnal Review*, 10(01), 32–41.
- Mudlofir, A., & Rusydiyah, E. F. (2017). *Desain Pembelajaran Inovatif dari Teori ke Praktik* (Cetakan ke). Rajawali Pers.
- Nasution, W. N. (2017). *Strategi Pembelajaran*. Perdana Publishing.
- Nhat, H. T., Lien, N. T., Tinh, N. T., Vu, N., Hang, T., & Trang, N. T. (2019). The Development of Critical Thinking for Students in Vietnamese Schools: From Policies to Practices. *American Journal of Education Research*, 6(5), 431–435. <https://doi.org/10.12691/education-6-5-10>
- Novitasari, L., Listyaningsih, & Estuningsih, R. (2024). Penerapan Model Project Based Learning Untuk Peningkatan Keterampilan Berpikir Kritis Pada Pembelajaran Pendidikan Pancasila di Kelas XI 9 SMA Negeri 21 Surabaya. *Jurnal Dimensi Pendidikan Dan Pembelajaran*, 12(2), 293–306.
- Nuridayah, F., Sugandi, A. I., & ... (2023). Systematic Literature Review: Pengembangan Kemampuan Berpikir Kritis Siswa Melalui Pembelajaran Discovery Learning. *Jurnal PEmbelafran Inovatif*, 6(5), 2075–2084. <https://doi.org/10.22460/jpmi.v6i5.17555>
- Peraturan Pemerintah Republik Indonesia No. 29 Tahun 1990 tentang Pendidikan Menengah* (pp. 9–25). (n.d.).
- Ponidi, & Rohman, I. M. (2021). Pengaruh Penggunaan Bahan Bakar Biosolar, Biosolar Dengan Aditive Dan Pertamina Dex Pada Mitsubishi L300 Terhadap Kepekatan Asap. *Jurnal Rekayasa Material, Manufaktur Dan Energi*, 4(1), 73–82.
- Purnamasari, Y., Meilinda, L., & Syukr, M. Y. (2022). Integrasi Kompetensi 4C Melalui Penggunaan Microsoft Teams dalam Pembelajaran. *Jurnal Dimensi Pendidikan Dan Pembelajaran*, 10(2), 131–137.
- Purwanto, N. (2014). *Psikologi Pendidikan*. PT Remaja Rosdakarya.
- Ridha, A. (2021). Inovasi Pendidikan pada Masa Perkembangan Teknologi dan Komunikasi. *Pharmacognosy Magazine*, 75(17), 399–405.
- Santoso, B. (2019). *Teknologi dan Pendidikan: Potensi dan Tantangan*. Universitas Gadjah Mada.
- Sarwono, J. (2016). *Metode Penelitian Kuantitatif dan Kualitatif*. Graha Ilmu.
- Siyoto, S., & Sodik, A. (2015). *Dasar Metodologi Penelitian*. Literasi Media Publisihing.
- Sudrajat, D. R., Disman, & Waspada, I. (2021). Analisis Kemampuan Berpikir Kritis Siswa pada Pembelajaran Ekonomi di SMA KHZ Musthafa Sukamanah Tasikmalaya. *Edunomic: Jurnal Ilmiah Pendidikan Ekonomi Fakultas Keguruan Dan Ilmu Pendidikan*, 9(2), 122–132. <https://doi.org/10.33603/ejpe.v9i2.4636>
- Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

- Sugono, D. (2008). *Kamus Besar Bahasa Indonesia*. Pusat Bahasa Departemen Pendidikan Nasional.
- Sukmayadi, T., Maarif, M., Fitri, H. R., Dewi, A. K., Merkuri, Y. G., & Haryanti, A. N. (2024). Membangun Keterampilan Berpikir Kritis Mahasiswa Melalui Literasi Kewarganegaraan di Universitas Ahmad Dahlan. *Jurnal Dimensi Pendidikan Dan Pembelajaran*, 12(2), 245–256. <https://doi.org/10.24269/dpp.v12i2.9388>
- Sumarlina, Rachmadiarti, F., & Prastiwi, M. S. (2020). Profil Keterampilan Inkuiri Siswa Kelas X SMA. *Bioedu*, 3(3), 564–570.
- Trianggono, M. M., Panglipur, I. R., Kurniawan, M. U., & Ashadi, F. (2022). Analisis Penerapan Metode Flipped Classroom dalam Menstimulasi Kemampuan Berpikir Kreatif Mahasiswa di Masa Pandemi Covid-19. *Jurnal Dimensi Pendidikan Dan Pembelajaran*, 10(1), 16–23. <https://doi.org/10.24269/dpp.v10i1.4659>
- Widodo, R. B., Alim, M. L., Ananda, R., & Surya, Y. F. (2024). Penerapan Metode Inquiry untuk Meningkatkan Keterampilan Proses Sains dalam Pembelajaran IPA di UPT SDN 010 Siabu. *Jurnal Dimensi Pendidikan Dan Pembelajaran*, 12(1), 38–53.
- Zakiah, Li., & Lestari, I. (2019). *Berpikir Kritis dalam Konteks Pembelajaran* (Issue August). Erzatama Karya Abadi.