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Improving Students' Critical Thinking and Writing Skills: Implementation using Integrated Problem Based Learning JEMBER Model Development

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Abstract

This study aims to examine the impact of implementing the JEMBER-IPBL model on improving students' critical thinking and writing skills, especially in English learning in vocational high schools. This study used a quasi-experimental design. The subjects of this research were 60 students from two classes of the Agribusiness Food Crops and Horticulture program in grade XI at vocational high school 5 Jember, during the 2024/2025 academic year. The sample was selected through purposive sampling. The aim of this study was to assess the effectiveness of the JEMBER Integrated Problem-Based Learning (IPBL) model in enhancing students' critical thinking and writing skills. The experimental group achieved an average score of 83.20, while the control group averaged 72.90. The corresponding p-value was 0.03, which is less than 0.05. the post-test outcomes demonstrated a notable increase, with the experimental group scoring an average of 83.67 compared to 76.17 in the control group. The p-value for this comparison was 0.038, which is less than 0.05. Therefore, this study indicates that the IPBL JEMBER model is effective in boosting both critical thinking and writing skills among students. Based on these results, it is recommended that teachers implement the IPBL JEMBER model in English instruction to improve students' critical thinking and writing abilities. This approach allows educators to better guide students toward a more active, reflective learning process that encourages critical analysis.

Keywords: *Critical Thinking. Writing Skills, Integrated Problem Based Learning JEMBER, Vocational High School.*

Introduction

In the era of globalization and rapid technological development, the main challenge in the world of education is to prepare students with skills that are not only technical, but also critical thinking skills and effective writing skills (Adhitya et al., 2022; Cornelia et al., 2025). Both of these skills are very important, especially in dealing with various complex problems that exist in society and the world of work. Critical thinking skills enable students to analyze, evaluate, and solve problems systematically, while writing skills help students to convey ideas, opinions, and thoughts clearly and structuredly (Amhar et al., 2022; Lubis, 2017; Suteja & Setiawan, 2022). In the context of education in Vocational High Schools (SMK), these skills are very relevant because students are not only required to master knowledge, but also to be able to apply it in real situations (Winarti & Yundayani, 2021).

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In the writing process, students apply other writing skills to explore their ideas. They get inspiration from reading various media or talking to other people, in which case they actually practice listening, reading, and speaking skills (Aini et al., 2022). In addition, they also need to master the linguistic elements used in writing such as grammar, vocabulary, and writing techniques including spelling, punctuation, capitalization, and abbreviations (Fauzia et al., 2022). In essence, the challenges faced by students are not only related to generating ideas and organizing them but also how the writing they produce meets the components of written language that is appropriate and easy for readers to understand.

To generate ideas in writing, critical thinking skills are needed. Critical thinking in the writing process involves analyzing, synthesizing, and evaluating information. With critical thinking skills, a person can analyze information, organize their thoughts, and effectively express their thoughts in writing (Nguyen Minh, 2024). Strong writing skills allow for accurate message delivery and interaction with diverse audiences (Sain et al., 2024). The concept of critical thinking includes analysis, reasoning, inference, comparing, hypothesis formulation, synthesis, testing and comprehensive conclusions (Buda et al., 2024). Critical thinking as an intelligent disciplined process of conceptualization, application, analysis, synthesis, and active and skilled evaluation collected from observation, experience, reflection, reasoning, or communication. In other words, critical thinking skills can be improved through structured writing exercises and reflection (Rossouw & Steenkamp, 2025). Critical thinking skills have a positive effect on writing skills. This can be seen from the results of his writing which is more substantial and effective (Puspita Sari et al., 2019). Students who have critical thinking skills can express various ideas clearly and critically, and can evaluate their ideas so that they can find solutions to solve problems (Inggritani & Fazriyah, 2017).

Despite efforts to modernize education, many classrooms still rely heavily on traditional teaching methods that emphasize rote memorization and passive learning. This approach often limits students' ability to think critically and express themselves through writing. As a result, learners frequently end up merely repeating information without truly understanding it or being able to present their thoughts in a clear, structured manner. To address this issue, it is crucial to implement more engaging and meaningful teaching strategies that support deeper thinking and effective communication.

A preliminary investigation conducted in class XI of the Agribusiness of Food Crops and Horticulture program at SMKN 5 Jember during the 2022/2023 and 2023/2024 academic years revealed that students' performance in writing argumentative texts averaged only 37.71, indicating a low proficiency level. Students faced various challenges, including difficulty analyzing information, generating ideas, applying proper English vocabulary and grammar, and structuring arguments coherently. Common issues also included trouble formulating thesis statements, supporting arguments, and drawing logical conclusions. Teacher interviews highlighted several contributing factors: writing instruction was infrequent due to time limitations, topics were often misaligned with students' vocational focus, and teaching strategies rarely involved problem-based learning. Additionally, students had limited opportunities for meaningful writing practice, often requiring extended time to complete writing tasks and receiving minimal teacher feedback due to large class sizes. As a result, writing instruction tended to emphasize final outputs rather than guiding students through the writing process itself.

Given these challenges, enhancing students' critical thinking and writing abilities has become increasingly important. Conventional teaching methods often fall short in actively engaging

learners or developing their ability to think deeply and communicate clearly. One promising approach is Integrated Problem-Based Learning (IPBL), which fosters active engagement, critical analysis, and collaborative problem-solving (Ruslan et al., 2021). IPBL involves using real-life problems as the foundation of the learning experience, prompting students to analyze situations, generate solutions, and refine their writing through ongoing practice and self-reflection (Gustin et al., 2018). This model blends problem-based learning with interdisciplinary integration, encouraging students to draw connections across subjects while addressing realistic scenarios (Nurtanto et al., 2018). Problem-Based Learning, in general, supports a more holistic and student-centered approach, promoting independence, critical thinking, and readiness for workplace challenges—qualities particularly essential in vocational education settings (Sitohang, 2024). Therefore, IPBL offers a relevant and effective framework for developing both academic and vocational competencies.

To support the effective evaluation of argumentative writing (Nurlela et al., 2025), students engage in peer assessments and participate in teacher-student conferences following a structured process: (1) Justify the issue, (2) Examine relevant concepts, (3) Investigate the problem, (4) Brainstorm solutions collaboratively, (5) Conduct evaluations, and (6) Revise their work. Interestingly, the first letters of these six steps form the acronym "JEMBER." Despite its potential, the integration of the IPBL approach with the JEMBER model remains underutilized. Therefore, a promising strategy for enhancing students' critical thinking and writing abilities is through the development of the JEMBER-IPBL model.

This model blends a problem-based learning framework with meaningful and context-driven learning materials, encouraging students to take an active role in exploring problems, identifying possible solutions, and articulating their reasoning through writing. Rather than merely focusing on content delivery, this method emphasizes the process of thinking critically and writing effectively. By using real-life challenges as the foundation of instruction, students are guided to think reflectively, creatively, and analytically, while also building their capacity to form logical arguments and express their ideas clearly in written form.

The goal of this study is to assess the impact of implementing the JEMBER-IPBL model on improving students' critical thinking and writing performance, particularly in English language instruction within vocational high schools. It is anticipated that this instructional approach will contribute significantly to shaping graduates who are not only knowledgeable but also skilled in critical reasoning and capable of effective communication qualities essential in both professional and everyday contexts.

Methods

This research employed a quasi-experimental approach to evaluate the effectiveness of the Integrated Problem-Based Learning (IPBL) JEMBER model in enhancing students' critical thinking and writing abilities. The focus of this instructional model is directed toward English language instruction at the Vocational High School (SMK) 5 Jember, specifically targeting eleventh-grade students enrolled in the Food Crop Agribusiness Program, with a concentration in Food Crop and Horticultural Agribusiness.

The study utilized a Nonequivalent Control Group Design, which is a commonly used format in quasi-experimental research. This design included two pre-existing groups: the experimental group, which received instruction through the IPBL JEMBER model, and the control group, which continued with the traditional teaching methods typically used by instructors in classroom

settings.

Participant selection was conducted through purposive sampling, with classes chosen based on their alignment with the study's objectives. The total sample consisted of 60 students, divided equally between the experimental and control groups, and both groups were determined to have comparable academic backgrounds based on prior performance data.

The instruments used for data collection comprised:

1. A critical thinking skills assessment, created using established indicators such as the capacity to analyze issues, evaluate arguments, draw logical conclusions, and make reasoned decisions.

2. A writing proficiency test, designed to assess students' skills in organizing thoughts, developing coherent paragraphs, constructing well-structured compositions, and applying appropriate grammar and vocabulary in English. This test was scored using a validated rubric developed by subject-matter experts.

The collected data were analyzed using the Independent Sample t-test, facilitated by IBM SPSS version 25, to determine whether statistically significant differences existed between the two groups' performance in critical thinking and writing. The significance threshold was set at $p < 0.05$. Results yielding a p-value below this threshold were interpreted as evidence of a statistically significant effect, indicating that the IPBL JEMBER model contributed meaningfully to improving students' critical thinking and writing competencies when compared to conventional instructional methods.

Results and Discussion

Prerequisite Test

The normality test in this research serves as a prerequisite for conducting the t-test analysis. For the t-test to be valid, the data involved must follow a normal distribution. To assess this, the Kolmogorov-Smirnov test was employed. As shown in Table 1, the pre-test results for critical thinking in the experimental group yielded a significance value of 0.352, while the control group scored 0.786 both exceeding the threshold of 0.05. Similarly, the post-test results for critical thinking showed values of 0.262 in the experimental group and 0.936 in the control group, again both greater than 0.05. For writing skills, the pre-test p-values were 0.841 for the experimental group and 0.235 for the control group. Additionally, the post-test values for critical thinking were 0.146 for the experimental group and 0.389 for the control group. Since all p-values are above 0.05, it can be concluded that the data from both groups are normally distributed.

Group		Experiment	Control	Information
Critical thinking skills	Pre test	0.352	0.786	Normal
	Post test	0.262	0.936	Normal
Writing skills	Pre test	0.841	0.389	Normal
	Post test	0.146	0.389	Normal

Table 1 Normality Test

Following the normality test, a homogeneity test was conducted as the next prerequisite before applying further statistical analysis. In this study, the Levene Test was used to assess the equality of variances. A dataset is considered homogeneous if the significance value obtained is greater

than 0.05. According to the results shown in Table 2, the significance value for the critical thinking pre-test was 0.803, which is above the 0.05 threshold, indicating that the pre-test data for critical thinking skills had homogeneous variance. For the post-test of the same variable, the significance value was 0.525, again greater than 0.05, confirming that the post-test results for critical thinking also met the assumption of homogeneity.

In terms of writing skills, the pre-test significance value was 0.160, indicating that the variance in this data set was also homogeneous. Likewise, the post-test results showed a significance value of 0.528, which exceeds the 0.05 benchmark, confirming that the writing skills data across groups maintained a consistent variance. Therefore, all data sets both pre-test and post-test for critical thinking and writing skills fulfilled the homogeneity assumption necessary for further statistical analysis.

Group		Levene Statistic	Sig.	Information
Critical thinking skills	Pretest	0.062	0.803	Homogeneous
	Posttest	0.410	0.525	Homogeneous
Writing skills	Pretest	0.615	0.160	Homogeneous
	Posttest	0.403	0.528	Homogeneous

Table 2 Homogeneous Test

Hypothesis Testing

To assess the effectiveness of the IPBL JEMBER model in enhancing students' critical thinking and writing abilities, this study utilized an independent samples t-test for hypothesis testing. This statistical method determines whether the mean differences between the experimental and control groups are statistically significant. A p-value of less than 0.05 indicates a meaningful difference between the groups, while a value above 0.05 suggests that any observed difference is not statistically significant.

In terms of critical thinking, the pre-test results showed that the experimental group achieved an average score of 53.87, while the control group scored slightly higher at 56.33. The significance value (Sig. 2-tailed) for this comparison was 0.560, which is greater than the 0.05 threshold. This indicates that there was no significant difference in critical thinking abilities between the two groups at the start of the study, suggesting similar baseline performance levels.

The post-test results, however, demonstrated a shift. The experimental group recorded a mean score of 83.20, while the control group averaged 72.90. With a p-value of 0.03 below the 0.05 threshold this result confirms a statistically significant improvement in critical thinking for the experimental group. These findings support the conclusion that the IPBL JEMBER model positively impacted students' critical thinking development.

Regarding writing skills, the pre-test scores showed the experimental group with an average of 57.67, and the control group with 58.50. The p-value for this comparison was 0.833, indicating no significant initial difference between the groups. However, post-test results revealed improvement: the experimental group achieved an average score of 83.67, while the control group reached 76.17. A p-value of 0.038 confirms that this difference is statistically significant, pointing to the effectiveness of the IPBL JEMBER model in improving students' writing performance.

Overall, as reflected in Table 3, these results demonstrate that the IPBL JEMBER model had a significant positive impact on students' critical thinking and writing skills, particularly within the vocational high school context.

		Group	Mean	Sig	Information
Critical thinking skills	Pre-test	Control	56.33	0.560	Not significant
		Experiment	53.87		
	Post-test	Control	72.90	0.003	Significant
		Experiment	83.20		
Writing skills	Pre-test	Control	58.50	0.833	Not significant
		Experiment	57.67		
	Post-test	Control	76.17	0.038	Significant
		Experiment	83.67		

Table 3. Independent Sample t-test

The findings of this study indicate that the IPBL JEMBER model effectively enhances the critical thinking abilities of vocational high school students. This result is in line with the research results from Gummah et al. (2023), Gusman et al (2023), Kumar & Refai (2017), dan Asyari et al. (2016) This supports the view that applying an integrated problem-based learning approach can lead to a meaningful improvement in students' ability to think critically. Additional evidence is provided by a study carried out by (Delago et al., 2016) the findings also indicate a positive impact, demonstrating that the Integrated Problem-Based Learning (IPBL) model can enhance learning outcomes, particularly in higher-order thinking domains such as evaluation, as outlined in Bloom's taxonomy. These results are consistent with the previously discussed studies. Supporting this, a systematic literature review conducted by (Romano Daba et al., 2019) an analysis of studies published between 2014 and 2019 that implemented the Integrated Problem-Based Learning (IPBL) approach reveals that this model is effective not only in enhancing student performance, but also in fostering greater learner engagement, interest, and motivation. These findings are further supported by recent research employing a systematic review methodology, as conducted by (Anggraeni et al., 2023) It was found that, from a total of 76 reviewed studies, the integration of problem-based learning with subject content consistently led to improvements in students' critical thinking abilities. These findings support the notion that the effectiveness of the IPBL JEMBER model in enhancing critical thinking may stem from the inherent strengths of the problem-based learning approach itself, which has long been recognized for fostering higher-order thinking. This outcome is likely influenced by the fact that the IPBL JEMBER model aligns well with the specific learning needs of vocational students, particularly in developing their critical thinking skills within the context of English language instruction.

The IPBL JEMBER model integrates a problem-based learning approach within the framework of English language education, encouraging students not only to comprehend content, but also to engage in deeper processes such as analyzing data, assessing arguments, formulating solutions, and making reasoned decisions. This model adopts a student-centered learning paradigm, giving learners opportunities to investigate real-world problems, collaborate in teams, and take responsibility for their reasoning through interactive activities like group discussions and presentations (Roh et al., 2014)**.** Furthermore, IPBL JEMBER promotes the use of diverse educational materials and project-based tasks that demand active cognitive engagement. The critical thinking involves clear, logical reasoning about decisions and beliefs. As such, the

learning experiences embedded in IPBL JEMBER directly support the development of higher-order thinking skills, which are essential components of critical thinking. The effectiveness of this model is also attributed to the teacher's role as a facilitator, guiding students through stages such as problem identification, hypothesis development, information gathering, and solution evaluation (Wardana et al., 2024). Learning within this framework is dialogic and collaborative, rather than unidirectional, fostering dynamic interaction between students and teachers, as well as among peers. Through this method, learners are not passive recipients of content but are transformed into active participants in the construction of knowledge. This empowers them to critically process, assess, and apply information (Wardana et al., 2023). Consequently, the application of the IPBL JEMBER model has proven effective in establishing a learning environment that strongly supports the development of students' critical thinking competencies.

The study's findings also revealed that the IPBL JEMBER model significantly enhances the writing skills of vocational high school students. This outcome is supported by earlier studies, PBL improves students' writing skills (Hadiansah et al., 2021). These results can be explained by several factors, including the specific advantages of the IPBL JEMBER model, which is particularly designed to foster writing improvement. The IPBL JEMBER model motivates students to actively engage in problem identification, situation analysis, and the communication of solutions through writing. This process demands that students not only grasp text structure, grammar, and vocabulary, but also develop their ideas, build arguments, and organize thoughts logically and coherently in written form (Fadhila & Rakhmawati, 2024). The problem-based assignments embedded in this model directly engage students in meaningful writing activities with real-world relevance. Through this approach, students progress through various stages of critical thinking, including problem comprehension, group discussion, research, and the final presentation of solutions in written format. This continuous writing practice contributes to improved content quality, organization, vocabulary, grammar, and writing mechanics (Priyanasari et al., 2021).

Moreover, the collaborative aspect of IPBL JEMBER further enhances this process, as peer feedback and teacher input are crucial in refining and enhancing the quality of students' writing. Through group discussions and presentations, students learn how to produce written work that is not only linguistically correct but also persuasive, informative, and contextually appropriate. This model also fosters students' intrinsic motivation to write, as they perceive their writing as purposeful and linked to solving real-world problems. This aligns with constructivist theory, which asserts that knowledge and skills develop more effectively when students engage in activities that are meaningful and connected to real-world contexts. In conclusion, it can be affirmed that the IPBL JEMBER model provides an environment conducive to the development of both critical thinking and writing skills, thereby enhancing students' abilities in both content and writing form.

Conclusion

This study shows that the development of the JEMBER Integrated Problem Based Learning model has been proven to improve students' critical thinking and writing skills in English subjects. Although the findings of this study are promising, several limitations must be considered. Firstly, the research was conducted with a specific cohort of students from a vocational high school, which may limit the ability to generalize the results to other educational levels or settings. The relatively small sample size, consisting of only 60 students, may also influence the robustness and generalizability of the conclusions. Additionally, the focus on

English language instruction limits the applicability of the IPBL JEMBER model to other academic subjects. Another constraint of this study is the duration of the intervention, which lasted only one semester. This timeframe may not have been sufficient to capture the long-term effects on students' critical thinking and writing abilities. Future research could extend the duration of the implementation to assess whether sustained use of the model yields more significant outcomes. Moreover, this study did not account for external factors, such as students' previous exposure to problem-based learning or their levels of motivation, which could have played a role in influencing the results.

To address these limitations and expand on the current findings, future studies could examine the IPBL JEMBER model across a broader range of educational contexts, including general high schools, universities, and other vocational institutions, to gain a clearer understanding of its effectiveness in diverse environments. Increasing the sample size and incorporating a variety of student groups would provide a more comprehensive picture of the model's impact. Furthermore, it would be valuable to extend the intervention period to investigate the long-term effects of the IPBL JEMBER model on students' critical thinking and writing skills. Future studies could also consider individual factors, such as motivation, prior knowledge, and other personal characteristics, and how they might influence the model's effectiveness. Lastly, the model's applicability could be tested in different subject areas beyond English, such as science, mathematics, or social studies, to determine whether its benefits extend across disciplines. Comparative research that contrasts the IPBL JEMBER model with other problem-based learning approaches could also shed light on which elements are most effective in fostering critical thinking and writing skills. By addressing these avenues, future research can offer a deeper understanding of how the IPBL JEMBER model can be refined and adapted for various educational environments and learning goals.

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Author Contribution

Wahyu Ekawati, Mustaji, and Miftakhul Jannah contributed to the conception, data collections, data processing, writing and review.

Conflict of Interest

There is no conflict of interest in the article.

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References

Adhitya, A., Astawan, I. G., & Adi, I. N. R. (2022). Pengembangan Instrumen Penilaian Keterampilan Berpikir Kritis dan Berpikir Kreatif Berbasis Google Form. Jurnal Ilmiah Pendidikan Citra Bakti, 9(2), 250–261. https://doi.org/10.38048/jipcb.v9i2.682

Aini, N., Widayanti, D. E., Winarto, A. E., & Kediri, I. (2022). An Analysis of Students' Ability in Writing Cause and Effect Essay at SMAN 1 Kediri. Journey (Journal of English Language and Pedagogy), 5(1), 64–73. https://doi.org/10.33503/journey.v5i1.521

Ambarwati, R., Febriana, A., Anggoro, B. S., & Putra, R. W. Y. (2022). The Effectiveness of Problem Based Learning Aided by Gamification Teaching Materials on Students' Mathematical Problem Solving Ability. Jurnal Pendidikan MIPA, 23(3), 1278–1285.

Amhar, A., Sabrina, R., Sulasmi, E., & Saragih, M. (2022). Student critical thinking skills and student writing ability: The role of teachers' intellectual skills and student learning. Cypriot Journal of Educational Sciences, 17(7), 2493–2510. https://doi.org/10.18844/cjes.v17i7.7683

Buda, Mhd. A. M., Siburian, J., & Musli. (2024). Improving Students' Critical Thinking Skills Using Multimedia in a Problem-Based Learning Model (PBL): a Narrative Review. Jurnal Ilmu Pendidikan (JIP) STKIP Kusuma Negara, 16(2), 245–265. https://doi.org/10.37640/jip.v16i2.2179

Cornelia, L., Hariyanti, U., & Suharsono, A. (2025). Analisis Perbedaan Kemampuan Menulis Argumentatif dan Berpikir Kritis pada Mahasiswa Pendidikan Teknologi Informasi melalui Implementasi Teknologi Berbasis AI. Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer, 9(3), 2548–2964. http://j-ptiik.ub.ac.id

Delago, L. C., Machado, M. E. F. H. S., De Brito, F. O., Landgraf, G. C., De Andrade Schroeder, M., & Torezzan, C. (2016). Learning lean philosophy through 3D game-based simulation. Proceedings - Winter Simulation Conference, 0. https://doi.org/10.1109/WSC.2016.7822369

Fadhila, A., & Rakhmawati, A. (2024). Model Pembelajaran Project-Based Learning (PBL) Berbasis Kearifan Lokal dalam Keterampilan Menulis Siswa SMA. Disastra: Jurnal Pendidikan Bahasa Dan Sastra Indonesia, 6(1), 157. https://doi.org/10.29300/disastra.v6i1.3316

Fauzia, F. I., Salamah, I. S., Zulfikar, M. F., & Hakim, R. T. (2022). Efektivitas Penggunaan Model Dan Media Pembelajaran Dalam Meningkatkan Keterampilan Menulis Siswa SD. Naturalistic: Jurnal Kajian Penelitian Dan Pendidikan Dan Pembelajaran, 7(1), 1370–1384. https://doi.org/10.35568/naturalistic.v7i1.2170

Gustin, M. P., Abbiati, M., Bonvin, R., Gerbase, M. W., & Baroffio, A. (2018). Integrated problem-based learning versus lectures: a path analysis modelling of the relationships between educational context and learning approaches. Medical Education Online, 23(1). https://doi.org/10.1080/10872981.2018.1489690

Hadiansah, D., Rara Pringgandinie, D., Rabiussani, R., & Ayunin, Y. Y. Q. (2021). Model Pembelajaran Project Based Learning (PBL) Dalam Meningkatkan Keterampilan Menulis Teks Drama Pada Siswa Mts Al Qomariyah Garut. Ed-Humanistics, 06(01), 746–752. https://doi.org/10.30870/jpsd.v3i2.2132

Huang, W., Li, X., & Shang, J. (2023). Gamified Project-Based Learning: A Systematic Review of the Research Landscape. Sustainability (Switzerland), 15(2). https://doi.org/10.3390/su15020940

Inggritani, F., & Fazriyah, N. (2017). Pengaruh Berpikir Kritis terhadap Kemampuan Menulis Narasi Siswa Kelas V Di Sekolah Dasar. JPSD, 3(2), 105–116. https://doi.org/10.30870/jpsd.v3i2.2132

Lubis, S. S. W. (2017). Keterampilan Menulis Essai Dalam Pembentukan Berpikir Kritis Mahasiswa Prodi PGMI UIN Ar-Raniry Banda Aceh. PIONIR Jurnal Pendidikan, 6(2), 1–17. https://doi.org/10.22373/pjp.v6i2.3338

Nguyen Minh, A. (2024). Leveraging ChatGPT for Enhancing English Writing Skills and Critical Thinking in University Freshmen. Journal of Knowledge Learning and Science Technology ISSN:

2959-6386 (Online), 3(2), 51–62. https://doi.org/10.60087/jklst.vol3.n2.p62

Nurlela Nurlela, Rohani Ganie, Mahriyuni Mahriyuni, & Muhammad Yusuf. (2025). Metode Pengembangan Tema Sebagai Upaya Meningkatkan Kemampuan Siswa SMA Imelda Medan dalam Menulis Teks Argumentasi. Sejahtera: Jurnal Inspirasi Mengabdi Untuk Negeri, 4(1), 214–221. https://doi.org/10.58192/sejahtera.v4i1.3018

Nurtanto, M., Nurhaji, S., Widjanarko, D., Wijaya, M. B. R., & Sofyan, H. (2018). Comparison of Scientific Literacy in Engine Tune-up Competencies through Guided Problem-Based Learning and Non-Integrated Problem-Based Learning in Vocational Education. Journal of Physics: Conference Series, 1114(1). https://doi.org/10.1088/1742-6596/1114/1/012038

Priyanasari, F., Anugrahana, A., & Zaini, E. (2021). Peningkatan Ketelitian dan Keterampilan Menulis Bahasa Indonesia dengan Model Pembelajaran PBL Secara Daring Siswa Kelas V SDN Cangkringan 1. Jurnal Pendidikan Dan Teknologi Indonesia, 1(6), 221–228. https://doi.org/10.52436/1.jpti.44

Puspita Sari, T., Dawud, & Andjani, K. (2019). Hubungan Kemampuan Berpikir Kritis dengan Kemampuan Menulis Teks Editorial Siswa Kelas XII. Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan, 4(1), 51–55. http://journal.um.ac.id/index.php/jptpp/

Roh, Y. S., Kim, S. S., & Kim, S. H. (2014). Effects of an integrated problem-based learning and simulation course for nursing students. Nursing and Health Sciences, 16(1), 91–96. https://doi.org/10.1111/nhs.12069

Romano Daba, J. B., Rosmansyah, Y., & Dabarsyah, B. (2019). Problem Based Learning Using Gamification: A Systematic Literature Review. Proceedings - 1st International Conference on Informatics, Multimedia, Cyber and Information System, ICIMCIS 2019. https://doi.org/10.1109/ICIMCIS48181.2019.8985216

Rossouw, M., & Steenkamp, G. (2025). Developing the critical thinking skills of first year accounting students with an active learning intervention. International Journal of Management Education, 23(1). https://doi.org/10.1016/j.ijme.2024.101086

Ruslan, M. S. H., Bilad, M. R., Noh, M. H., & Sufian, S. (2021). Integrated project-based learning (IPBL) implementation for first year chemical engineering student: DIY hydraulic jack project. Education for Chemical Engineers, 35, 54–62. https://doi.org/10.1016/j.ece.2020.12.002

Sain, Z. H., Serban, R., Abdullah, N. B., & Thelma, C. C. (2024). Benefits and Drawbacks of Leveraging ChatGPT to Enhance Writing Skills in Secondary Education. At-Tadzkir: Islamic Education Journal, 4(1), 40–52. https://doi.org/10.59373/attadzkir.v4i1.79

Sitohang, M. J. (2024). Peran Model Pembelajaran Problem-Base Lerning (PBL) Dalam Meningkatkan Kompetensi Peserta Didik Di Era Digital. Basilius Eirene: Jurnal Agama Dan Pendidikan, 3(1), 42–57. https://doi.org/10.63436/bejap.v3i1.59

Suteja, S., & Setiawan, D. (2022). Students' Critical Thinking and Writing Skills in Project-Based Learning. International Journal of Educational Qualitative Quantitative Research, 1(1), 16–22. https://doi.org/10.58418/ijeqqr.v1i1.5

Wardana, A., Sukestiyarno, Y. L., Wardono, W., & Suyitno, A. (2024). Penerapan Model Independent Problem Based Learning (IPBL) untuk Meningkatkan Keampuan Berpikir Kritis dalam Menyelesaikan Soal Matematika Siswa SMA. PRISMA, Prosiding Seminar Nasional Matematika, 7, 496–502. https://proceeding.unnes.ac.id/prisma

Wardana, A., Sukestiyarno, Y., Wardono, & Suwarno. (2023). Improve Mathematics Learning Outcomes in High School with Critical Thinking Skills through Independence Problem-Based Learning (IPBL) Approach. Integral: Jurnal Penelitian Pendidikan Matematika, 6(1), 1–11. https://doi.org/10.24905/jppm.v6i1.122

Winarti, N., & Yundayani, A. (2021). Korelasi antara Keterampilan Berpikir Kritis dengan Keterampilan

Menulis Teks Argumentatif. Prosiding Seminar Nasional Pendidikan STKIP Kusuma Negara III SEMNARA 2021, 144–152