13. 14515-53474-2-CE.docx

anonymous marking enabled

Submission date: 16-Mar-2025 01:58PM (UTC-0700)
Submission ID: 2493062514
File name: 13._14515-53474-2-CE.docx (573.95K)
Word count: 2894
Character count: 19678

HYDROGEN
JURNAL KEPENDIDIKAN KIMIA
https://e-journal.undikma.ac.id/index.php/hydrogen/index

February 2025. 13(1)
e-ISSN: 2656-3061
p-ISSN: 2338-6487
pp. 130-138

Profile of Critical Thinking Skills and Cultural Literacy of Students in the Basic Chemistry Course

Khaeruman*[1], Ketut Suma[2], Siti Maryam[2], I Wayan Suastra[2], Siti Nurhidayati[3]

[1*] Department of Chemistry Education, Faculty of Applied Science and Engineering, Universitas Pendidikan Mandalika, Jl. Pemuda No. 59A, Mataram, Indonesia 83125
[2] Department of Educational Sciences, Faculty of Education, Universitas Pendidikan Ganesha, Jl. Udayana No. 11, Singaraja, Bali, Indonesia 81116.
[5] Department of Biology Education, Faculty of Applied Science and Engineering, Universitas Pendidikan Mandalika, Jl. Pemuda No. 59A, Mataram, Indonesia 83125
* Corresponding Author e-mail: khaeruman@student.undiksha.ac.id

Article History
Received: 21-01-2025
Revised: 18-02-2025
Published: 28-02-2025

Keywords: basic chemistry; critical thinking skills; cultural literacy; local wisdom - based learning; student skill profile.

Abstract

This study investigates the profile of critical thinking skills and cultural literacy among students in the Basic Chemistry course at the Faculty of Science, Technology, and Applied Sciences, Universitas Pendidikan Mandalika. In the context of globalization and rapid technological advancements, critical thinking and cultural literacy are crucial competencies for facing the challenges of the 21st century and the Fourth Industrial Revolution. Despite the foundational importance of Basic Chemistry in science education, challenges such as conceptual complexity and low student engagement remain prevalent. Employing a descriptive quantitative approach, this research involves students from Chemistry, Biology, Physics, and Mathematics Education programs. Instruments used include critical thinking tests and cultural literacy questionnaires measuring understanding of local cultural values and diversity. Data were collected through tests, questionnaires, and semi-structured interviews and analyzed descriptively using statistical methods. Findings reveal that students exhibit low levels of critical thinking skills and cultural literacy, with strengths in data interpretation and cultural preservation, while weaknesses are evident in identifying relevant information and cultural promotion. These results highlight the need for innovative instructional models integrating local wisdom into the learning process. The proposed Free Inquiry-Based Etnochemistry Model aims to enhance both critical thinking skills and cultural literacy by contextualizing scientific concepts within local cultural practices, offering a holistic solution to contemporary educational demands.

How to Cite: Khaeruman, K., Suma, K., Maryam, S., Suastra, I., & Nurhidayati, S. (2025). Profile of Critical Thinking Skills and Cultural Literacy of Students in the Basic Chemistry Course. Hydrogen: Jurnal Kependidikan Kimia, 13(1), 130-138. doi:https://doi.org/10.33394/hjkk.v13i1.14515

https://doi.org/10.33394/hjkk.v13i1.14515

INTRODUCTION

In the era of globalization and rapid technological advancement, higher education is expected to produce graduates who are competent, adaptable, and equipped with 21st-century skills. Two essential competencies emphasized in education today are critical thinking skills and cultural literacy, especially in addressing the challenges of the Industrial Revolution 4.0 (Suciono et al., 2020). The Basic Chemistry course, as one of the foundational subjects in science education, holds significant potential for developing these two skills. However, the teaching of Basic Chemistry often faces various challenges, such as the complexity of concepts and the low level of active student engagement, necessitating innovative and relevant teaching approaches (Kirana & Kusairi, 2019; Suciono et al., 2020).

Various studies have shown that students' critical thinking skills remain at a low level (Kirana & Kusairi, 2019; Rasmawan, 2017). Students often struggle to identify alternative solutions to complex problems or lack creativity in finding solutions (Anugraheni, 2020). For instance, the critical thinking skills of Chemistry Education students in 2020, particularly on the concept of the mole, were still categorized as unskilled. Pratiwi et al. (2023) identified the main inhibiting factors as the online learning system and the use less relevant teaching methods. Additionally, Utami et al. (2023) identified four main indicators of critical thinking skills: interpretation, analysis, evaluation, and inference. Although evaluation is relatively the most mastered indicator, students' abilities in analysis and inference generally require significant improvement. This highlights the need for context-based teaching strategies that can effectively encourage the development of students' critical thinking skills.

Several creative teaching methods have been proposed to enhance critical thinking skills. For example, the use of student worksheets (SW) based on scientific literacy has proven effective in optimizing students' critical thinking skills (Listiani, 2018; Zahroh & Yuliani, 2021; Hulyadi et al., 2024). Nadia's research (2024) also found that critical thinking skills are crucial for solving higher-order thinking skills (HOTS)-based problems in chemistry topics, including colloid systems.

In addition to critical thinking skills, cultural literacy is also an integral aspect of science education. Cultural contexts have been shown to influence students' self-efficacy, which ultimately contributes to the development of critical thinking skills (Nuraeni et al., 2019). Cultural literacy in the Basic Chemistry course can be integrated through the exploration of local wisdom, which not only strengthens students' understanding of chemistry concepts but also creates meaningful and contextual learning experiences (Pratama, 2023). For instance, project-based approaches involving direct interaction with the surrounding environment have been proven to enhance students' conceptual understanding and critical thinking skills simultaneously.

However, research on the integration of critical thinking skills and cultural literacy in the teaching of Basic Chemistry remains limited. Most studies tend to focus on one of these aspects without comprehensively connecting both skills. Furthermore, few studies explore how local wisdom-based approaches can be effectively applied in Basic Chemistry teaching, particularly at the university level for students in science education programs such as chemistry, biology, physics, and mathematics.

Therefore, this study aims to map the profile of students' critical thinking skills and cultural literacy in the Basic Chemistry course at the Faculty of Science, Technology, and Applied Sciences, Universitas Pendidikan Mandalika. This study is expected to provide an initial overview of students' abilities, identify potential and challenges in integrating these two skills, and serve as a foundation for developing innovative local wisdom-based teaching models to better prepare students for the demands of global education and society.

METHOD

This study employs a descriptive quantitative approach to map the profile of students' critical thinking skills and cultural literacy in the Basic Chemistry course. The subjects of this study were students enrolled in chemistry, biology, physics, and mathematics education programs who had completed most of the Basic Chemistry course content. Subjects were selected using a purposive sampling technique (Sugiyono, 2021).

The research instruments consisted of a critical thinking skills test and a cultural literacy questionnaire. The critical thinking skills test was based on five indicators: identifying relevant

information, analyzing and evaluating data, interpreting data, solving quantitative problems, and comparing and classifying. Cultural literacy questionnaire to measure students' understanding and application of local cultural values in the learning process (Wicaksono, 2022).

The research flow is illustrated in Figure 1 below.

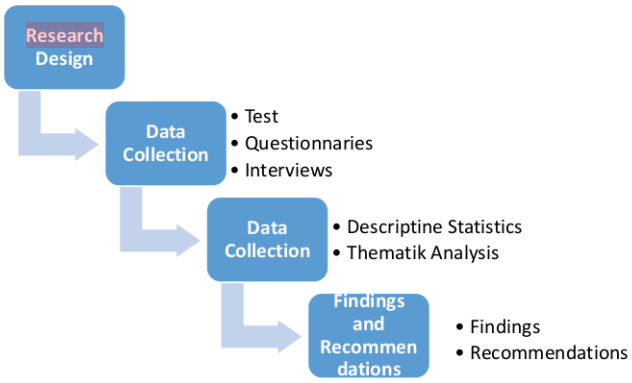

Figure 1. Research Flowchart: Steps in Mapping Critical Thinking Skills and Cultural Literacy in Basic Chemistry

Data were collected through tests, questionnaires, and semi-structured interviews to gain deeper insights into students' perceptions (Pratama, 2023). Quantitative data were analyzed descriptively using descriptive statistics, including mean and frequency distribution, to describe the profiles of students' skills. Qualitative data obtained from interviews were analyzed thematically to complement and strengthen the quantitative findings (Hadi & Junaidi, 2020). This study aims to provide a comprehensive understanding of students' skills, which will serve as the foundation for developing a local wisdom-based teaching model to meet the demands of 21st-century education (Firmansyah & Rizal, 2019; Asmaningrum et al., 2018).

RESULTS AND DISCUSSION

Students' Critical Thinking Skills

To understand the profile of students' critical thinking skills, an analysis was conducted based on the average critical thinking skill scores across four study programs: Chemistry Education, Biology Education, Physics Education, and Mathematics Education, as shown in Figure 2.

Figure 2 illustrates the average critical thinking skill scores of students from the four study programs. All programs fall into the low category, with average scores below 54 (Magfiroh et al., 2023). This finding is consistent with Kirana and Kusairi (2019), who identified that critical thinking skills among students in science education programs remain low. Similar findings were also reported by Farcis (2019), who noted that the average critical thinking skill score of Physics Education students at the University of Palangka Raya was only 25.8%, with significant weaknesses in the indicators of self-regulation (12.5%) and inference (22.5%). This underscores the urgency of developing effective and targeted instructional strategies to comprehensively enhance students' critical thinking skills.

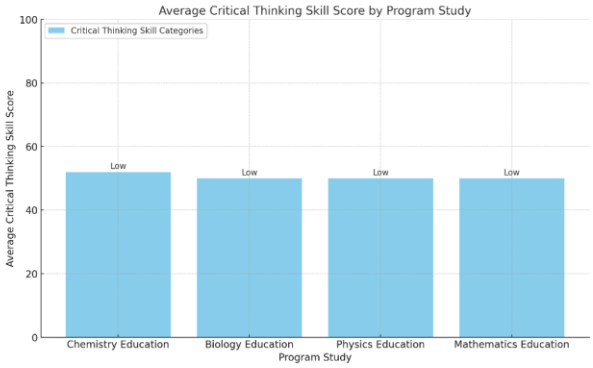

Figure 2. Distribution of Average Critical Thinking Skill Scores and Categories by Study Program

Relevant studies highlight the importance of developing critical thinking skills through appropriate approaches. Rositawati (2019) found that the inquiry method significantly improves students' critical thinking abilities, providing a strong theoretical foundation for integrating exploratory approaches into learning. Furthermore, Hidayat et al. (2018) emphasized that integrating scientific processes into teaching materials can help improve critical thinking skills and strengthen the relevance of holistic local wisdom-based instructional approaches. Novitasari (2023) also highlighted that explanation and self-regulation indicators often pose challenges in chemistry education, necessitating explicit instructional guidance to address these weaknesses.

Additionally, Ningsih et al. (2018) emphasized the need for accurate measurement tools to evaluate critical thinking skills. Idris (2018) pointed out that variations in critical thinking abilities across study programs call for contextualized teaching approaches. Based on this analysis, teaching models such as the Ethnochemistry-Based Free Inquiry Model are relevant to improving students' critical thinking skills.

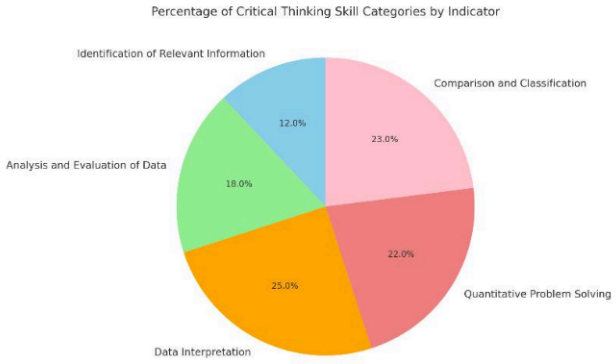

Figure 3. Percentage of Critical Thinking Skill Categories by Indicator

In addition to the average score analysis, Figure 3 presents the percentage distribution of critical thinking skill categories across five main indicators: identifying relevant information (12%), analyzing and evaluating data (18%), interpreting data (25%), solving quantitative problems (22%), and comparing and classifying (23%). The interpretation indicator shows the highest percentage (25%), reflecting students' strength in understanding data. Conversely, the identifying relevant information indicator (12%) represents the greatest weakness. Research by Magfiroh et al. (2023) supports this finding, indicating that deficiencies in identifying relevant information are often due to the lack of integration of technology-based learning strategies, such as Nearpod, to train this skill. The inquiry model proposed by Rositawati (2019) offers a potential solution by involving active exploration and in-depth data analysis.

Thus, developing local wisdom-based or interactive technology-based instructional strategies that target low-performing indicators, particularly identifying relevant information, should be prioritized to enhance students' critical thinking skills holistically.

Students' Cultural Literacy

To understand the profile of students' cultural literacy, an analysis was conducted based on the average cultural literacy scores across four study programs: Chemistry Education, Biology Education, Physics Education, and Mathematics Education. This analysis aimed to determine the level of students' cultural literacy and its variations among the study programs analyzed. Cultural literacy encompasses students' ability to understand, appreciate, and apply local cultural values in academic and social contexts. The results of the analysis of students' cultural literacy scores are presented in Figure 4 below.

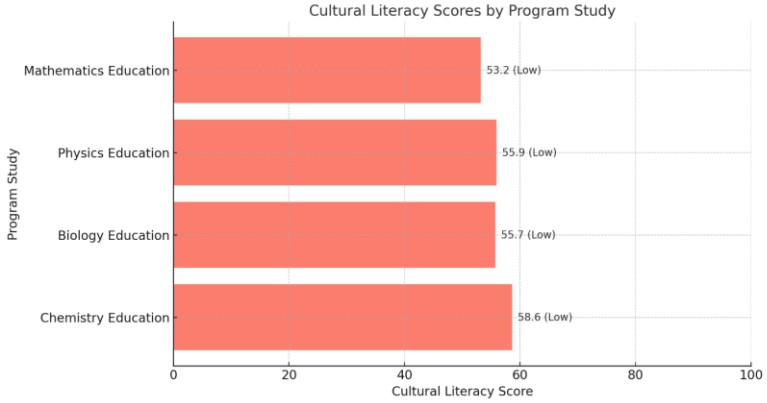

Figure 4. Cultural Literacy Scores of Students Across Program Studies

Figure 4 illustrates the cultural literacy scores of students by study program. The Chemistry Education program recorded the highest cultural literacy score, at 58.6, followed by Physics Education (55.9) and Biology Education (55.7). The Mathematics Education program had the lowest cultural literacy score, at 53.2, but all study programs fall into the low category (Lestari et al., 2022).

Hidayat et al. (2018) stated that the low level of cultural literacy can be attributed to the lack of integration of local values into the learning process. Zahroh and Yuliani (2021) emphasized that teaching materials based on scientific literacy, focusing on local culture, can enhance students' cultural literacy.

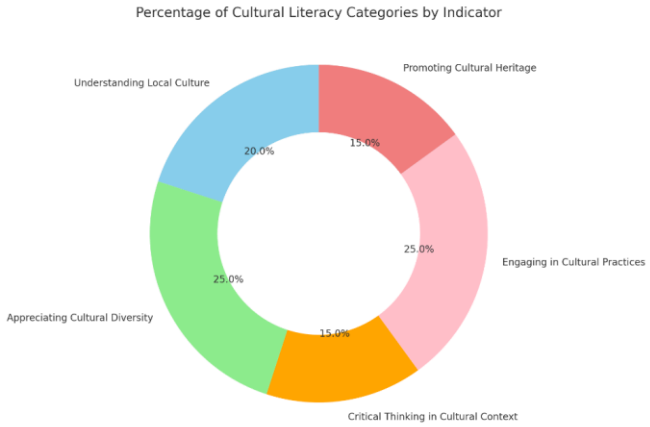

Figure 5. Distribution of Cultural Literacy Categories by Indicator

Figure 5 illustrates the percentage distribution of cultural literacy based on indicators such as the Importance of Preserving Culture (25%), Appreciation of Cultural Diversity (22%), Interest in Learning About Culture (20%), Understanding Local Cultural Diversity (18%), and Interest in Promoting Culture (15%). The low percentage of the last indicator highlights the lack of motivation among students to actively promote local culture. This underscores the need for innovative teaching approaches that encourage active student engagement in exploring local culture.

Teaching models such as the Ethnochemistry-Based Free Inquiry Model can serve as holistic solutions. By integrating local cultural elements into science learning, this model not only enhances critical thinking skills but also deepens students' understanding of local culture. Hidayat et al. (2018) demonstrated that context-based local exploration enriches students' learning experiences, making learning more relevant and meaningful.

CONCLUSION

This study reveals that students' critical thinking skills and cultural literacy in the Basic Chemistry course are still in the low category. Indicator analysis shows that students have the highest competency in data interpretation and awareness of the importance of preserving culture, while the main weaknesses lie in identifying relevant information and interest in promoting local culture.

RECOMMENDATIONS

To address these weaknesses, the development of the Ethnochemistry-Based Free Inquiry Model is proposed as an innovative approach. This model integrates the exploration of local culture into chemistry learning to simultaneously enhance critical thinking skills and cultural literacy. This approach is expected to create more relevant and meaningful learning experiences, strengthen students' connection to their local cultural context, and prepare them to become competent, adaptive graduates ready to face global challenges.

ACKNOWLEDGEMENTS

We would like to sincerely thank all individuals and institutions who supported and contributed to the implementation of this research. Your assistance and encouragement throughout the research process have been invaluable and are deeply appreciated.

BIBLIOGRAPHY

Anugraheni, I. (2020). Analisis Kesulitan Mahasiswa dalam Menumbuhkan Kemampuan Berpikir Kritis melalui Pemecahan Masalah. *Jurnal Cendekia: Jurnal Pendidikan Matematika, 4*(1), 261-267. https://doi.org/10.31004/cendekia.v4i1.197

Asmaningrum, H., Koirudin, I., & Kamariah, K. (2018). Pengembangan panduan praktikum kimia dasar terintegrasi etnokimia untuk mahasiswa. *JTK (Jurnal Tadris Kimiya)*, 3(2), 125–134. https://doi.org/10.15575/jtk.v3i2.3205

Farcis, F. (2019). Profil keterampilan berpikir kritis mahasiswa pendidikan fisika universitas Palangka Raya dalam proses analisis artikel ilmiah. *Jurnal Jejaring Matematika dan Sains*, 1(1), 52–58. https://doi.org/10.36873/jjms.v1i1.137

Firmansyah, A., & Rizal, R. (2019). Potret keterampilan berpikir kritis dan motivasi berprestasi mahasiswa PGSD Universitas Tadulako. *Jurnal Inspirasi Pendidikan*, 9(2), 103–109. https://doi.org/10.21067/jip.v9i2.3323

Hadi, M., & Junaidi, M. (2020). Prinsip dan langkah-langkah penerapan focus group discussion untuk meningkatkan keterampilan berbicara dan berpikir kritis mahasiswa. *Jurnalistrendi: Jurnal Linguistik Sastra dan Pendidikan*, 5(2), 126–134. https://doi.org/10.51673/jurnalistrendi.v5i2.426

Hidayat, S., Supriadin, S., & Iskandar, J. (2018). Pengembangan prototipe buku ajar terintegrasi proses saintifik untuk meningkatkan keterampilan berpikir kritis siswa. *Konstan - Jurnal Fisika dan Pendidikan Fisika*, 3(1), 36-47. https://doi.org/10.20414/konstan.v3i1.3

Hulyadi, H., Bayani, F., Ferniawan, Rahmawati, S., Liswijaya, Wardani, I. K., & Swati, N. N. S. (2024). Meeting 21st-Century Challenges: Cultivating Critical Thinking Skills through a Computational Chemistry-Aided STEM Project-Based Learning Approach. *International Journal of Contextual Science Education*, *1*(2), 57–64. https://doi.org/10.29303/ijcse.v1i2.609

Idris, T. (2018). Profil berpikir kritis mahasiswa program studi pendidikan biologi se-kota Pekanbaru. *Bioedusiana Jurnal Pendidikan Biologi*, 4(2), 1-7. https://doi.org/10.34289/277898

Kirana, I. E., and Kusairi, S. (2019). Profil Kemampuan Berpikir Kritis Mahasiswa Program Studi Pendidikan IPA dalam Kasus Grafik Kinematika Satu Dimensi. Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan, 4(3), 363—368. http://dx.doi.org/10.17977/jptpp.v4i3.12113

Lestari, I. D., Ratnasari, D., & Usman. (2022). Profil kemampuan literasi bahasa, literasi budaya, dan kewargaan pada mahasiswa Universitas Sultan Ageng Tirtayasa. *Indonesian Journal of Educational Development, 3*(3), 1-10. https://doi.org/10.5281/zenodo.7365078

Listiani, I. (2018). Efektifitas Lembar Kerja untuk Memberdayakan Kemampuan Berpikir Kritis Mahasiswa Pendidikan Guru Sekolah Dasar. Jurnal Penelitian Pendidikan, 35(1), 17-25. http://dx.doi.org/10.15294/jpp.v35i1.13547

Maghfiroh, R., Wahyuni, S., & Ridlo, Z. R. (2023). The Development of Critical Thinking Skills Assessment Instrument Based on Nearpod in Junior High School Science Learning. *Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*, *11*(3), 706-718. https://doi.org/10.33394/j-ps.v11i3.7876

Ningsih, D., Ramalis, T., & Purwana, U. (2018). Pengembangan tes keterampilan berpikir kritis berdasarkan analisis teori respon butir. *Wahana Pendidikan Fisika (Wapfi)*, 3(2), 45. https://doi.org/10.17509/wapfi.v3i2.13730

Novitasari, K. (2023). Analisis keterampilan berpikir kritis menurut indikator Facione pada pembelajaran kimia daring dan luring. *Jurnal Sains Riset*, 13(3), 839–849. https://doi.org/10.47647/jsr.v13i3.2017

Nuraeni, S., Feronika, T., & Yunita, L. (2019). Implementasi self-efficacy dan keterampilan berpikir kritis siswa pada pembelajaran kimia di abad 21. *Jambura Journal of Educational Chemistry*, 1(2), 49-56. https://doi.org/10.34312/jjec.v1i2.2553

Oktariani, O., Febliza, A., & Fauziah, N. (2020). Keterampilan berpikir kritis calon guru kimia sebagai kesiapan menghadapi revolusi industri 4.0. *Journal of Natural Science and Integration*, 3(2), 114. https://doi.org/10.24014/jnsi.v3i2.8791

Pratama, H. (2023). Pembelajaran kimia organik dengan kombinasi project-based learning dengan pendekatan jelajah alam sekitar. *Journal of Education Action Research*, 7(3), 351-357. https://doi.org/10.23887/jear.v7i3.67336

Pratiwi, J., Erlina, Rasmawan, R., Enawaty, E., & Ulfah, M. 2023. Profile of Critical Thinking Skills of Chemistry Education Students in Solving Problems Related to the Concept of Mole. *Jurnal Pendidikan Sains Indonesia (Indonesian Journal of Science Education), 11*(3): 559-573. https://dx.doi.org/10.24815/jpsi.v11i3.30372

Rasmawan, R. (2017). Profil keterampilan berpikir kritis mahasiswa dan korelasinya dengan indeks prestasi akademik. *EduChemia (Jurnal Kimia dan Pendidikan),* 2(2), 130-140. https://dx.doi.org/10.30870/educhemia.v2i2.1101

Rositawati, D. (2019). Kajian berpikir kritis pada metode inkuiri. *Prosiding SNFA (Seminar Nasional Fisika dan Aplikasinya)*, 3, 74. https://doi.org/10.20961/prosidingsnfa.v3i0.28514

Siswati, B., Hariyadi, S., & Corebima, A. (2020). Hubungan antara berpikir kritis dan metakognitif terhadap hasil belajar mahasiswa biologi dengan penerapan model pembelajaran RWRS. *Lensa (Lentera Sains) Jurnal Pendidikan IPA*, 10(2), 74-82. https://doi.org/10.24929/lensa.v10i2.110

Suciono, W., Rasto and EengAhman. (2020). Analysis of Factors Affecting Students' Critical Thinking Ability in Economic Learning in the Revolutionary Era 4.0. *SOCIA: Jurnal Ilmu-ilmu Sosial*, *7*(1), 48 – 56. http://dx.doi.org/10.21831/socia.v17i1.32254

Sugiyono. (2021). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.

Utami, A. R. P., Mustapa, Jannah, M., Ermita, M., Jannah, M., & Wathi, A. F. D. (2023). Analisis Berpikir Kritis Mahasiswa Mata Kuliah Kimia Dasar Materi Ikatan Kimia. *Oxygenius*, 5(2), 127–131. https://doi.org/10.37033/ojce.v5i2.608

Wicaksono, A. (2022). Potensi pemberdayaan keterampilan berpikir kritis mahasiswa calon guru sekolah dasar melalui model discovery learning. *Jurnal Basicedu*, 6(1), 1398–1407. https://doi.org/10.31004/basicedu.v6i1.2229

Zahroh, D., & Yuliani, Y. (2021). Pengembangan e-LKPD berbasis literasi sains untuk melatihkan keterampilan berpikir kritis peserta didik pada materi pertumbuhan dan perkembangan. *Berkala Ilmiah Pendidikan Biologi (Bioedu)*, 10(3), 605–616. https://doi.org/10.26740/bioedu.v10n3.p605-616

13. 14515-53474-2-CE.docx

ORIGINALITY REPORT

43%	38%	32%	23%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	e-journal.undikma.ac.id Internet Source	8%
2	ejournal.unsub.ac.id Internet Source	3%
3	jurnal.uns.ac.id Internet Source	3%
4	repository.usd.ac.id Internet Source	3%
5	repository.upi.edu Internet Source	2%
6	ejournal.undiksha.ac.id Internet Source	2%
7	R Febriana, P Sinaga. "Evaluation of critical thinking skills of class x high school students on the material of Newton's laws", Journal of Physics: Conference Series, 2021 Publication	2%
8	jurnal.stkippgritulungagung.ac.id Internet Source	1%
9	Syarif Rizalia, Endang Wuriani. "Pengembangan Lembar Kerja Peserta Didik (LKPD) Berbasis Literasi Sains Materi Sistem Ekskresi", KULIDAWA, 2023 Publication	1%
10	jppipa.unram.ac.id Internet Source	1%

11	ejurnal.ung.ac.id Internet Source	1 %
12	jurnal.fkip.unila.ac.id Internet Source	1 %
13	ejournal.iainkerinci.ac.id Internet Source	1 %
14	ejurnal.budiutomomalang.ac.id Internet Source	1 %
15	likhitapradnya.wisnuwardhana.ac.id Internet Source	1 %
16	ijoerar.net Internet Source	1 %
17	mail.jurnalbeta.ac.id Internet Source	1 %
18	Submitted to Universitas Tanjungpura Student Paper	1 %
19	journal.unj.ac.id Internet Source	1 %
20	repo.umb.ac.id Internet Source	1 %
21	www.indochembull.com Internet Source	1 %
22	Yusran Khery, Masjudin Masjudin, Ahmad Muzaki, Baiq Asma Nufida, Yesi Lesnawati, Sri Rahayu, Nur Candra Eka Setiawan. "Mobile-Nature of Science Model of Learning for Supporting Student Performance on General Chemistry Classroom", International Journal of Interactive Mobile Technologies (iJIM), 2020 Publication	1 %

23	Saidil Mursali, Utami Sri Hastuti, Siti Zubaidah, Fatchur Rohman. "Guided inquiry with Moodle to improve students' science process skills and conceptual understanding", International Journal of Evaluation and Research in Education (IJERE), 2024 Publication	<1 %
24	chem-upr.education Internet Source	<1 %
25	journal.walisongo.ac.id Internet Source	<1 %
26	"Educational Technology to Improve Quality and Access on a Global Scale", Springer Science and Business Media LLC, 2018 Publication	<1 %
27	Neni Hasnah Fatimah, Usman Usman, Sukemi Sukemi. "Effectiveness of the Reading, Answering, Discussing, Explaining, and Creating (RADEC) Learning Model in Improving High School Students' Critical Thinking Skills on Colloid Material", Jambura Journal of Educational Chemistry, 2024 Publication	<1 %
28	ojs.fkip.ummetro.ac.id Internet Source	<1 %
29	Ririn Wulandari. "EFEKTIVITAS MODEL PEMBELAJARAN : Problem Based Learning", Open Science Framework, 2023 Publication	<1 %
30	Ade Gafar Abdullah, Vina Adriany, Cep Ubad Abdullah. "Borderless Education as a Challenge in the 5.0 Society", CRC Press, 2020 Publication	<1 %

31	repository.lppm.unila.ac.id Internet Source	<1 %
32	www.grafiati.com Internet Source	<1 %
33	doaj.org Internet Source	<1 %
34	e-journal.hamzanwadi.ac.id Internet Source	<1 %
35	journal.wima.ac.id Internet Source	<1 %
36	jurnal.unej.ac.id Internet Source	<1 %
37	jurnal.usk.ac.id Internet Source	<1 %
38	Ashadi, Joko Priyana, Basikin, Anita Triastuti, Nur Hidayanto Pancoro Setyo Putro. "Teacher Education and Professional Development in Industry 4.0", CRC Press, 2020 Publication	<1 %
39	Mu'afiah Mu'afiah, M. Misbakhul Munir, Indriati Paskarini. "Relation between Activator Factors and Compliance Behavior of Using Personal Protective Equipment on Technician Workers at PT ARPS Surabaya", The Indonesian Journal Of Occupational Safety and Health, 2021 Publication	<1 %
40	indochembull.com Internet Source	<1 %
41	jurnal.untan.ac.id Internet Source	<1 %

42	Ivayuni Listiani, Herawati Susilo, Sueb Sueb. "Relationship between Scientific Literacy and Critical Thinking of Prospective Teachers", AL-ISHLAH: Jurnal Pendidikan, 2022 Publication	<1 %
43	Yuli Rahmawati, Peter Charles Taylor. "Empowering Science and Mathematics for Global Competitiveness", CRC Press, 2019 Publication	<1 %

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	Off		