

The Effect Ecological Citizenship on Critical Thinking Skills of Elementary School Student

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Abstract

Amidst of global environmental challenges, ecological awareness as a form of ecological citizenship is believed to have an influence on the critical thinking skills of elementary school students. This study aims to analyze the influence of ecological citizenship on the critical thinking skills of elementary school student through a systematic literature review of selected scientific articles. The method used is a meta-synthesis of literature, which includes the stages of identification, selection, and thematic analysis based on a systematic protocol. The results of the study indicate that ecological citizenship has a significant relationship with critical thinking skills: international studies found a positive correlation, while national studies showed an increase in analytical thinking after environmental citizenship program interventions. A deep ecological understanding encourages students to evaluate information based on evidence, consider environmental ethical implications, and make reflective decisions. Furthermore, the integration of ecological education into learning has been proven to strengthen critical thinking habits systematically. Conclusion, ecological citizenship significantly contributes to the development of critical thinking in elementary school students and need to be strategically integrated into the elementary school curriculum.

Keywords: *ecological citizenship, critical thinking, elementary school students*

Abstrak

Di tengah tantangan lingkungan global, kesadaran ekologis sebagai bentuk pendekatan *ecological citizenship* diyakini memiliki pengaruh signifikan terhadap kemampuan berpikir kritis siswa sekolah dasar. Penelitian ini bertujuan untuk menganalisis pengaruh *ecological citizenship* terhadap keterampilan berpikir kritis (*critical thinking*) siswa SD melalui studi kajian literatur artikel ilmiah terpilih. Metode yang digunakan adalah metasintesis literatur, yang meliputi tahap identifikasi, seleksi, dan analisis tematik berdasarkan protokol sistematis. Hasil kajian menunjukkan bahwa *ecological citizenship* memiliki hubungan signifikan dengan kemampuan berpikir kritis: studi internasional menemukan korelasi positif, studi nasional menunjukkan peningkatan berpikir kritis setelah intervensi program kewarganegaraan lingkungan. Pemahaman ekologis yang mendalam mendorong siswa untuk mengevaluasi informasi berdasarkan bukti, mempertimbangkan implikasi etis lingkungan, serta mengambil keputusan secara reflektif. Lebih lanjut, integrasi pendidikan ekologis dalam pembelajaran terbukti memperkuat kebiasaan berpikir kritis secara sistematis. Simpulan: *ecological citizenship* berkontribusi signifikan terhadap pengembangan berpikir kritis siswa SD dan perlu diintegrasikan secara strategis dalam kurikulum pendidikan dasar.

Kata kunci: *ecological citizenship, keterampilan berpikir kritis, siswa SD*



INTRODUCTION

The current climate change is no longer just a threat to the future but a real and dangerous threat to health, life, and exacerbates ongoing injustice around the world. Budiman. Y.N (2023) said that only a few people are willing to participate in preventing the climate crisis. One of the reasons for the low public participation in environmental issues is the ineffective communication methods and literacy access in conveying information about climate change. The increasingly complex environmental changes demand solutions based on education, which not only impart knowledge but also shape character and critical thinking skills in the younger generation. So far, the education system has been too focused on cognitive achievement, exam scores, and college preparation. However, education should create individuals who are ecologically aware, not just academically intelligent. Global environmental crises such as climate change, biodiversity loss, and environmental pollution demand a new approach to education (UNESCO, 2021). One approach that has emerged in response to these challenges is the concept of ecological citizenship, which refers to citizens awareness and responsibility toward environmental issues, manifested through behavior, participation, and decision making oriented toward sustainability (Artha et al., 2024).

The concept of ecological citizenship emphasizes the involvement of individuals as ecological citizens who are aware of the impact of their actions on ecosystems and global communities (Dobson, 2007). In the context of ecological citizenship, individuals must act as agents of change who are actively able to contribute to protecting the environment. Ecological citizenship can support environmental policies by educating the public to become role models in environmentally friendly activities (Misra., 2023). Ecological citizenship not only emphasizes environmental knowledge but also fosters critical, reflective, and collaborative attitudes in dealing with everyday ecological issues (Fatmalasari et al., 2019). Karatekin et al. (2018) state that ecological citizenship is essentially the attitude of citizens based on concern and responsibility for the environment by striving to manage, maintain, protect, and preserve the environment. Ecological citizenship can be understood as a human right to the environment and a sense of responsibility not to damage the environment and to participate in maintaining environmental sustainability (Raessens., 2019). Ecological citizenship has become an important concept and idea today due to global trends that have caused environmental damage, as the environment is a very important aspect of life in supporting human survival. The idea of ecological citizenship has emerged and explains that society, as citizens, must protect and preserve the environment. This concept of ecological citizenship can guide individuals to behave and act toward nature in efforts to maintain environmental conservation and sustainability (Sari et al., 2020).

Therefore, the involvement of individuals as ecological citizens is essential in supporting collective progress toward better environmental sustainability. Education that integrates the values of ecological citizenship is seen as capable of encouraging students to think reflectively, analytically, and responsibly about environmental issues. Ecological citizenship is an alternative approach that can be used to enhance students natural intelligence, particularly their critical thinking skills. Simsar (2021) states that the ecological citizenship model is crucial for improving students critical thinking abilities and helping them become a generation that cares about the environment and is committed to preserving and maintaining it sustainably. The impact of this program can improve students attitudes and behavior as a form of ecological citizenship. At the elementary school level, an approach that integrates the values of ecological citizenship is crucial because this is the phase where students are in the process of character formation and the development of their basic values.

Facione (2015) states that one of the skills that needs to be developed early on is critical thinking, which is the ability to analyze, evaluate, and make decisions based on logical and reflective thinking. Research by Krasny et al. (2013) shows that

education that integrates environmental issues contextually can enhance students critical thinking capacity through discussion activities, problem-solving learning, and multi-perspective analysis. Santika et al. (2019) argue that critical thinking skills are the ability to think deeply about decisions and problem-solving, analyze and evaluate opinions, and act clearly and accurately. Critical thinking is the ability to reflect on one's knowledge, think rationally and factually, and use relevant information to solve a problem. (Lopez et al., 2022). Developing critical thinking skills involves clarifying, developing major skills, making decisions, and establishing further strategies. According to Ennis (2011), the definition of critical thinking is the process of integrating previously obtained information with current understanding to arrive at conclusions relevant to solving a problem. Ennis et al. (2012) on critical thinking skills share a similar meaning, particularly in aspects that explain that critical thinking is 1) cognitive skills such as interpreting, adding, concluding, analyzing, evaluating, and making decisions appropriate for seeking relevant and accountable information, 2) the ability to develop values such as caution, humility, integrity, intellectualism, and empathy. Critical thinking skills, according to Ulva (2018), are needed by students because they can help students sort information, select what is important, question the truth of an issue, and solve abstract problems.

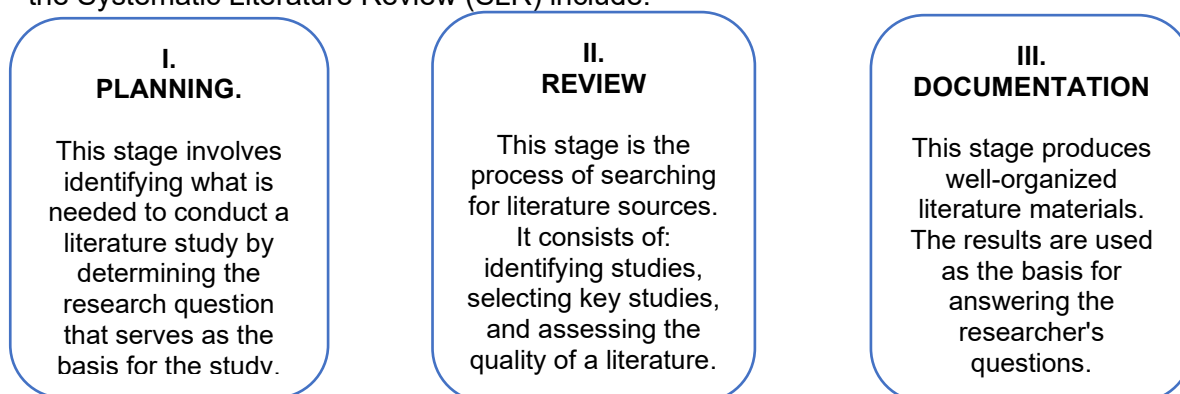
This study presents a new approach by systematically examining the influence of ecological citizenship on the critical thinking skills of elementary school students through the Systematic Literature Review (SLR) method. The novelty of this study lies in its interdisciplinary approach, which combines the concept of ecological citizenship as a value framework with critical thinking skills as a 21st-century learning objective in the context of elementary school education. Unlike previous studies, which are generally empirical and focus on a single location and specific teaching methods, this research synthesizes findings from various relevant global and national scientific articles to provide a comprehensive overview of the relationship between ecological awareness as a form of ecological citizenship and critical thinking skills in elementary school students. This study offers a new perspective on how ecological citizenship values can be used as a foundation for developing critical thinking skills in elementary school students. The findings from this study are expected to provide strategic direction for the development of curriculum, contextual learning, and environment-based character education that is more integrated and aligned with the needs of the 21st century. This meta-synthesis approach enables the identification of patterns, supporting factors, and barriers influencing the effectiveness of ecological citizenship implementation in the context of elementary education, while highlighting the role of environmental education and citizenship education as vehicles for fostering sustainable critical thinking skills.

Previous research shows that education oriented toward ecological citizenship can increase environmental awareness, active participation, and students ability to identify and critically assess environmental issues (Suroto et al., 2021). In addition, this approach also encourages students to engage in real action, both in the school environment and in the community, thereby strengthening critical thinking skills through direct experience and reflection. Based on this urgency, this study has the following research questions: : 1). How is the concept of ecological citizenship developed in elementary school education? 2). How does ecological citizenship influence the critical thinking skills of elementary school students? Research objectives : 1). To describe the concept of ecological citizenship as applied in elementary school education. 2). To examine and synthesize the influence of ecological citizenship on the critical thinking skills of elementary school students. Although many studies have examined ecological citizenship and critical thinking skills separately, there is a lack of studies that explicitly link the two concepts, especially in the context of elementary school education using a systematic literature review approach. Most previous studies have focused more on

developing environmental awareness or improving critical thinking skills separately, without integrating the two holistically. Additionally, existing literature remains limited in identifying the factors that mediate the influence of ecological citizenship on critical thinking skills at the elementary education level, as well as how instructional models and school policies can optimize this relationship. On the other hand, research on ecological citizenship itself has predominantly been conducted at the secondary and higher education levels, and has primarily addressed normative and policy aspects rather than implementation and its impact on elementary school students critical thinking skills. This indicates a research gap in the literature, namely the absence of a systematic synthesis linking ecological citizenship to the critical thinking skills of elementary school students through empirical and theoretical approaches. Therefore, this study fills this gap by conducting a systematic and critical literature synthesis to gain a deeper understanding of the mechanisms and impacts of ecological citizenship on the critical thinking skills of elementary school students.

METHOD

The research method in this study uses a Systematic Literature Review (SLR) approach to analyze the relationship between ecological citizenship and critical thinking skills in elementary school students (Simamora, S.C., 2024). The SLR method was chosen because it provides a comprehensive and systematic review of scientific literature relevant to the research topic, resulting in a valid and reliable synthesis. The SLR process was conducted through several main stages, including formulating research questions, developing a literature search strategy using specific keywords, selecting data sources from various academic databases, and applying inclusion and exclusion criteria to filter suitable articles. Next, the selected articles were analyzed thematically to identify patterns, relationships, and key findings related to the effects of ecological citizenship on critical thinking in elementary school students. The stages of the Systematic Literature Review (SLR) include:



Pict. 1. SLR Stages

In conducting this SLR, the researchers followed a strict protocol to ensure transparency and reproducibility of results, including the use of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework, which is the standard for systematic literature reviews (Ringo, S.S., 2025). Additionally, the quality of each primary study included in the analysis was critically assessed to minimize bias and enhance the reliability of conclusions. With this approach, the research not only collects data comprehensively but also integrates findings from various contexts and previous research methods, thereby providing a more holistic picture of how ecological citizenship contributes to the development of critical thinking skills in elementary school students. This SLR approach also enables the identification of research gaps and

recommendations for further studies in the field of environmental education and critical thinking skills development.

RESULTS AND DISCUSSION

A. The Concept of Ecological Citizenship in Elementary Schools

Ecological citizenship in elementary schools is an educational approach that emphasizes the importance of knowledge, skills, ethics, and responsibility towards the environment in students from an early age. This ecological citizenship-based educational model has proven effective in enhancing naturalistic intelligence among elementary school students, as developed by Astuti and Pratiwi (2023). This ecological citizenship model integrates environmental learning into the curriculum, enabling students not only to understand ecological concepts theoretically but also to cultivate concern and responsibility for preserving their surrounding environment. Contextual and problem-based learning approaches have also proven effective in shaping ecological citizenship attitudes. A study conducted by Ruchliyadi et al. (2023) in an elementary school based on aquatic environments showed that student involvement in solving real environmental problems around them significantly fosters ecological citizenship attitudes and behaviors. Activities such as waste management, greening, and water conservation are integral parts of the learning process. The concept of ecological citizenship in elementary schools can be developed through the integration of character education, contextual learning, ecological literacy, inquiry-based learning, and nature-based learning. Previous research has emphasized the importance of integrating ecological literacy into ecological citizenship. Ningsih (2021) emphasizes that strengthening ecological competencies through citizenship education can build environmental awareness and responsibility as the main foundation of ecological citizenship at the elementary school level. This integration not only enhances knowledge but also shapes students' characters to care about local and global environmental issues. Additionally, inquiry-based and socioscientific learning approaches are crucial in operationalizing ecological citizenship at the elementary school level. Christodoulou and Grace (2024) demonstrate that through biodiversity projects, students can connect local actions with global environmental issues, enabling them to better understand the meaning and impact of ecological actions. The approach in these activities also encourages students to think reflectively and critically about environmental issues. The nature-based learning model integrated with citizenship curriculum competencies is also effective in developing ecological citizenship. The research conducted by Christodoulou and Grace (2024) emphasizes the importance of inquiry-based learning and out of class projects in shaping ecological citizenship in elementary school students. Through their "Wild Citizens" program, which focuses on the issue of biodiversity loss, students are guided to explore the environment around their school, then discuss and take concrete actions to enhance biodiversity. This approach not only fosters ecological awareness but also develops the knowledge, attitudes, skills, and action competencies that are at the core of ecological citizenship. Students are able to connect the local actions they take with global activities, making the concept of ecological citizenship more meaningful and applicable in their daily lives.

Another study conducted in the UK by Miller et al. (2020) states that ecological learning integrated with citizen science in elementary schools can increase students' active participation in environmental issues. Through activities that require observation, data collection, and reflection, students are able to develop a deeper understanding of the relationship between humans and the environment. This reinforces the concept of ecological citizenship as citizenship that is not only environmentally conscious but also capable of actively participating

in maintaining and improving the condition of the surrounding ecosystem. Sari and Pratiwi (2022) emphasize in their research that outdoor learning activities that bring students closer to nature can build knowledge, skills, and environmental ethics holistically. This is reinforced by the implementation of practical learning steps such as introducing environmental concepts through calming activities for students, habit-forming activities in maintaining cleanliness, wise use of resources, and activities involving students in greening and conservation efforts.

In addition, research by Nordic Practical steps such as those described by Rakhmawati et al. (2023) form a comprehensive character education framework to instill the values of ecological citizenship from an early age, namely in primary education. Thus, primary school students not only become individuals who care about the environment but are also able to play an active role as agents of change in their communities in a sustainable manner. Through various models and learning strategies implemented in primary education, students are able to connect social actions with global issues that can build ecological awareness among students, and students can become agents of environmental change from an early age.

B. The Influence of Ecological Citizenship on Elementary School Students' Critical Thinking Skills

Ecological citizenship and elementary school students critical thinking skills are closely related and reinforce each other. The influence between ecological citizenship and elementary school students critical thinking skills is supported by various studies that emphasize the importance of participatory and pedagogical approaches. Another study conducted by Hadjicgambis et al. (2023) highlights the importance of citizen science-based learning models in developing critical thinking skills. A systematic literature review by Hadjichambis et al. (2023) confirms that citizen science initiatives in schools can empower students as agents of environmental change by developing critical thinking skills through active participation and scientific investigation. Student involvement in citizen science projects can encourage students to collect data, analyze findings, and make evidence-based decisions. This process strengthens the connection between ecological citizenship and critical thinking skills, as students learn to assess the validity of information obtained, consider problems and solutions from various perspectives, and develop innovative solutions to environmental issues. The theoretical framework outlined in Citizen Science for Environmental Citizenship (CS4EC) emphasizes the transformative power of participatory learning in developing critical thinking and environmental agency in students. According to Hadjichambis et al. (2023), active participation in environmental projects encourages students to reflect on their actions and develop critical thinking about complex environmental issues. The practice of citizen science in schools, as found in a study conducted by Ramjan (2022), provides sensory and relational experiences that strengthen students ecological citizenship and critical thinking skills. Through direct involvement in environmental research activities, students are able to learn to identify problems, analyze data, and make evidence-based decisions, thereby enhancing their critical thinking skills and ecological responsibility.

The program implemented by Christodoulou et al. (2023) called "Wild Citizens" proves that students can develop environmental awareness, a sense of responsibility, and confidence in influencing the results of environmental awareness activities. All these aspects are closely related to students critical thinking skills, as they are trained to analyze problems, formulate solutions, and independently evaluate the impact of their actions. This study shows that the implementation of ecological citizenship in elementary schools plays an important role in developing

students critical thinking skills. The “Wild Citizens” program in the UK involves students in biodiversity projects, which they undertake to identify environmental issues. Not only that, but they also engage in discussions about biodiversity and design solutions to real-world problems. Through inquiry-based learning and real-world action, students not only understand ecological issues but also develop analytical, evaluative, and critical reflective skills regarding the impact of their actions on the surrounding environment and global issues.

Miller et al. (2020) in their research confirm that ecological citizenship learning integrated with a socio-ecological approach and civic engagement can improve students capacity for critical thinking. By involving students in discussions, simulations, and collaborative projects, they are encouraged to evaluate the impact of individual and collective choices on the environment. This strengthens critical thinking skills such as evaluating existing evidence, argumentation, and ethical decision-making in ecological citizenship. A study by Fauziah and Ambarwati (2023) also shows that critical thinking and collaboration skills significantly influence students ecological awareness and attitudes. Nurwido (2015) asserts that problem-based and collaborative learning not only improves critical thinking but also shapes sustainable environmental behavior in elementary school students. Environmental education that integrates problem-based learning and real-world challenges has proven to be more effective in fostering critical thinking skills that are essential for ecological citizenship. Learning materials and activities that require students to evaluate evidence, make decisions, and solve environmental problems directly, as explained by Ecosystem Essentials (2025), are crucial for shaping an analytical and responsible generation. The involvement of elementary school students as citizen scientists in environmental research also supports the development of critical thinking skills through a more authentic scientific inquiry-based learning approach. A study conducted by Miczajka et al. (2015) states that active participation in environmental studies enhances students scientific skills and ecological citizenship, strengthening the relationship between ecological citizenship and critical thinking skills. Through participatory approaches, inquiry-based learning, and citizen science, students not only understand environmental issues but also develop critical thinking skills, which are the ability to analyze, evaluate, and solve problems critically. Contextual and action-based environmental education is more effective in shaping students who think critically while also being responsible as ecological citizens. Additionally, nature-based learning-based environmental education has proven effective in fostering students critical thinking skills. A study conducted by Cheah and Huang (2019) in Nordic countries shows that integrating environmental education into all aspects of the curriculum and school culture can encourage students to think critically and reflectively, identify environmental issues, and seek solutions based on real-world experiences and contextual learning. Thus, ecological citizenship serves as an important foundation for the sustainable development of critical thinking skills in elementary school students.

CONCLUSION

The results of the literature study conducted can be concluded that the concept of ecological citizenship in elementary schools is a very important educational approach in shaping ecological awareness and critical thinking skills in students. Through the integration of environmental education into the curriculum, students are not only taught about ecological theory, but they are also involved in practical activities that can foster a sense of responsibility for the surrounding environment. Learning models based on real-life experiences, such as waste management, greening, and water conservation, have proven effective in building ecological citizenship attitudes

and behaviors. Relevant research shows that student involvement in real life environmental projects can improve their understanding of ecological issues and encourage them to take an active role in protecting the environment.

Furthermore, the relationship between ecological citizenship and students critical thinking skills is very close and mutually reinforcing. Various studies show that participatory approaches, such as citizen science and inquiry-based learning, can improve students critical thinking skills. Through active involvement in environmental projects, students learn to collect data, analyze information, and make evidence-based decisions. This process not only strengthens critical thinking skills but also builds a deep sense of ecological responsibility. Thus, students not only become environmentally conscious individuals but also agents of change who are able to think critically about complex environmental issues.

The importance of integrating ecological literacy and character education in learning is also highlighted in this study. Through a holistic approach, students can develop comprehensive environmental knowledge, skills, and ethics. Studies show that outdoor learning activities that bring students closer to nature can build ecological awareness and critical thinking skills. By linking local actions to global issues, students can gain a deeper understanding of the impact of their actions on the environment. This shows that education based on real and contextual experiences is very effective in shaping students character to care about environmental issues.

Finally, this study confirms that ecological citizenship must be strategically integrated into the elementary school curriculum. By implementing various innovative learning models and strategies, students can be equipped with the critical thinking skills essential for facing future environmental challenges. Environmental education based on a participatory and action oriented approach not only enhances students ecological awareness but also fosters a generation that is analytical, responsible, and capable of contributing to environmental sustainability. Therefore, it is crucial for educators and policymakers to continue developing and implementing this approach in primary education so that students can become effective agents of change in their communities.

REFERENCES

- Artha, I. G.A., Suardana, I. W., & Sari, N.P. (2024). *Ecological citizenship: A new approach to environmental education*. International Journal of Environmental Education, 15(1), 45-60.
- Astuti, W., & Pratiwi, D. (2023). *Development of ecological citizenship-based character education model to improve environmental naturalistic intelegence of elementary scholl student*. Journal of Environmental Education, 12(3), 45-60. <https://ejournal.uin-malang.ac.id/index.php/madrasah/article/view/12291>
- Cheah, P.S., & Huang, Y. (2019). *Integrating environmental edication into the curriculum: A case study in Nordic countries*. Environmental Education Research, 25(6), 789-805. <https://journals.oslomet.no/index.php/nordiccie/article/download/3268/3384?inline=1>
- Christodoulou, A., & Grace, M. (2023). *Wild Citizen: Enganging students in biodiversity projects to foster ecological citizenship and critical thinking*. Environmental Education Research, 30(1), 78-95. <https://www.tandfonline.com/doi/full/10.1080/13504622.2024.2363848>
- Dobson, A. (2007). *Environmental citizenship: Towards sustainable development*. Environmental Politic, 16(3), 1-20.
- Ennis, R.H. (2011). *Critical thinking: A streamlined conception*. Teaching Philosophy, 34(1), 1024.

- https://www.pdcnet.org/teachphil/content/teachphil_2011_0034_0001_0001_0016
- Ennis, R.H., et al. (2012). *The role of critical thinking in education*. *Educational Philosophy and Theory*, 44(5), 1-15. <https://www.tandfonline.com/doi/abs/10.1111/j.1469-5812.2011.00773.x>
- Facione, P. A. (2015). *Critical thinking: What it is and why it counts*. Insight Assessment.
- Fatmalasari, F., et al. (2019). *The role of ecological citizenship in fostering environmental awareness among students*. *Journal of Environmental Education*, 10(2), 123-135.
- Fauziah, N., & Ambarwati, S. (2023). *The impact of collaborative learning on critical thinking and ecological awareness*. *International Journal of Science Education*, 45(2), 123-145. <https://jbasic.org/index.php/basicedu/article/view/8462>
- Hadjichambis, A., et al. (2023). *How can we transform citizens into 'environmental agents of change'? Towards the citizen science for environmental citizenship (CS4EC) theoretical framework based on a meta-synthesis approach*. *International Journal of Science Education, Part B*. <https://ktisis.cut.ac.cy/bitstream/20.500.14279/29948/1/How%20can%20we%20transform%20citizens%20into%20environmental%20agents%20of%20change%20Towards%20the%20citizen%20science%20for%20environmental%20citizenship%20CS4EC%20theoretical.pdf>
- Karatekin, K., et al. (2018). *Ecological citizenship: A framework for environmental education*. *Environmental Education Research*, 24(5), 1-25.
- Krasny, M. E., et al. (2013). *Environmental education and critical thinking: A case study*. *Journal of Environmental Education*, 14(4), 45-60.
- Lopez, M.J., et al. (2022). *Critical thinking in environmental education: A review of literature*. *Environmental Education Research*, 28(3), 345-360.
- Miller, J.R., et al. (2020). *Integrating ecological citizenship and critical thinking in elementary education: A case study*. *Journal of Environmental Education*, 21(4), 234-250.
- Misra, A. (2023). *The role of ecological citizenship in environmental policy*. *Environmental Politics*, 32(2), 1-20.
- Miczajka, A., et al. (2015). *Citizen science and critical thinking: A new approach to environmental education*. *International Journal of Science Education*, 37(5), 1-15. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0143229>
- Ningsih, S. (2021). *The importance of ecological literacy in ecological citizenship*. *Journal of Environmental Education*, 11(2), 67-80. <https://ejournal.uin-malang.ac.id/index.php/madrasah/article/view/12291>
- Nurwido, A. (2015). *Problem-based learning and critical thinking in environmental education*. *International Journal of Environmental Science Education*, 10(3), 345-360. <https://eprints.umm.ac.id/id/eprint/11214/1/Yustan%20Nurwido%20Pantiwati%20-%20Peningkatan%20Kemampuan%20Berpikir%20Kritis.pdf>
- Raessens, J. (2019). *Human rights and ecological citizenship: A new perspective*. *Environmental Politics*, 28(4), 1-20.
- Rakhmawati, D. et al. (2023). *Building a comprehensive character education framework for ecological citizenship*. *Journal of Character Education*, 19(1), 1-15. <https://conferenceproceedings.ump.ac.id/pssh/article/view/835>
- Ramjan, L. (2022). *Citizen science and environmental education: A transformative approach*. *Environmental Education Research*, 28(2), 123-140. <https://storre.stir.ac.uk/bitstream/1893/35463/1/PhD%20Final%20Version%20for%20Storre%20CRamjan%2010.23.pdf>

- Ringo, S. S. (2025). Systematic Literature Review dengan Metode Prisma. *Didaktika: Jurnal Pendidikan Sekolah Dasar*, 8(1), 12–26.
<https://ojsdikdas.kemendikdasmen.go.id/index.php/didaktika/article/view/1760>
- Ruchliyadi, A., et al. (2023). *Envirolmental problem-solving in elementary education: A case study*. *International Journal of Environmental Science Education*, 18(2), 1-15. <https://journal.staihubbulwathan.id/index.php/alishlah/article/view/4429>
- Sari, N.P., et al. (2020). *Ecological citizenship and envirolmental education: A framework for sustainable development*. *Journal of Envirolmental Education*, 15(3), 45-60.
- Sari, R. N., & Pratiwi, S. (2022). *Nature-Based Learning Models for Ecological Citizenship Formation in Primary Schools*. *Humaniora*. 13(2), 6886. <https://journal.binus.ac.id/index.php/Humaniora/article/download/6886/4157>
- Santika, I., et al. (2019). *Critical thinking skills in envirolmental education: A review*. *International Journal of Environmental Science Education*, 14(4), 1-15.
- Simamora, S. C. (2024). Systematic Literature Review: Hubungan Variabel Digital Marketing Terhadap Kinerja Pemasaran. *Journal Publicuho* 5(1), 107–115. <https://journal.universitassuryadarma.ac.id/index.php/ilmiahm-progress/article/view/1182>
- Simsar, A. (2021). *The importance of ecological citizenship in fostering critical thinking*. *Journal of Environmental Education*. 12(1), 1-15.
- Suroto, A., et al. (2021). *Ecological citizenship and critical thinking: A systematic review*. *Environmental Education Research*, 27(5), 1-15.
- Ulva, R. (2018). *The role of critical thinking in environmental education*. *International Journal of Environmental Science Education*, 13(2), 1-15.
- UNESCO. (2021). *Education for sustainable develompent: A global perspective*. UNESCO Publishing.
- Zainuddin, M., & Rahman, A. (2022). *The impact of environmental education on critical thinking skills*. *Journal of Environmental Education*, 14(3), 1-15.