

GREEN MINDS, FUTURE TEACHERS: EXPLORING ENGLISH PRESERVICE TEACHERS' PERCEPTIONS ON GREEN EDUCATION

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Abstract: Green education for students is an effective strategy for reducing environmental damage. However, its implementation faces various challenges, including insufficient teacher knowledge. This research aims to explore teachers' perceptions of the implementation of green education. Six preservice teachers from the English Department of MNC University participated in the study. A purposive sampling technique was used to select the participants. The study adopted a descriptive method with a qualitative approach, employing interviews to gather data. The findings show that preservice teachers in the English Education program at MNC University possess both the knowledge and a favorable perception of green education in schools. It is suggested that all stakeholders support the implementation of green education in Indonesia. By involving all parties, from educators to policymakers, the program can be more effective and impactful.

Keywords: Preservice Teachers, Perceptions, Green Education

Abstrak: Pendidikan hijau bagi siswa merupakan strategi efektif untuk mengurangi kerusakan lingkungan. Akan tetapi, implementasinya menghadapi berbagai tantangan, termasuk pengetahuan guru yang kurang memadai. Penelitian ini bertujuan untuk mengeksplorasi persepsi guru tentang implementasi pendidikan hijau. Enam calon guru dari Jurusan Bahasa Inggris MNC University berpartisipasi dalam penelitian ini. Teknik purposive sampling digunakan untuk memilih partisipan. Penelitian ini mengadopsi metode deskriptif dengan pendekatan kualitatif, menggunakan wawancara untuk mengumpulkan data. Temuan penelitian menunjukkan bahwa calon guru dalam program Pendidikan Bahasa Inggris di MNC University memiliki pengetahuan dan persepsi yang baik tentang pendidikan hijau di sekolah. Disarankan agar semua pemangku kepentingan mendukung implementasi pendidikan hijau di Indonesia. Dengan melibatkan semua pihak, mulai dari pendidik hingga pembuat kebijakan, program ini dapat lebih efektif dan berdampak.

Kata kunci : Calon Guru, Persepsi, Pendidikan Hijau

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INTRODUCTION

Changes in environmental quality happen so quickly that they have become a focal point for national and international institutions. The United Nations Environment Programme (UNEP), a leading global authority on environmental issues, reports that climate change, nature, and biodiversity huge pressured and environmental pollution are some of the biggest environmental problems. Maurya et al., (2020) explain that the primary contributors to environmental degradation are human activities such as modern

urbanization, industrialization, overpopulation, and deforestation, as well as natural factors like floods, typhoons, droughts, rising temperatures, and fires. In industrial cities like Jakarta, environmental degradation due to changes in land cover leads to higher surface temperatures and lower humidity (Putra Arie Gayo, 2023). Moreover, it is also found that the factors contributing to environmental degradation in Indonesia include per capita income, trade openness, energy consumption, and population size (Robbi & Hoetoro, 2020). Since the environment exists to meet all human needs, human behavior towards the environment should align with environmental sustainability, ensuring that it serves not only the present but also future generations.

To lead people to be aware of environmental sustainability, the existence of education is needed. The term "education" broadly includes acquiring general knowledge, personal awareness, and skills training. However, not all forms of education effectively promote behavioral change (Arlinghaus & Johnston, 2018). Schools as education institutions need to address environmental concerns as part of their commitment to environmental preservation and sustainability. It has been proved that green education positively impacts students' environmental attitudes and environmental behaviors (Efiariza et al., 2021). To incorporate green education in schools, Saprodi et al., (2019) proposed three ways: integrating environmental education into the national curriculum, specific programs, and learning activities. Behavior change is promoted through green education by informing individuals about sustainable practices and their environmental impact, encouraging them to adopt positive behaviors. This can involve adopting energy-efficient habits, minimizing waste, conserving water, and making informed consumer choices (Aggarwal, 2023). With their role in shaping student character, schools must actively contribute to equipping students with positive behaviors regarding environmental conservation.

In the context of English Language Teaching and learning, it is proposed that green education can be inserted in four big ways such as including environmental topics in language curricula, syllabi, and textbook development; providing environmentally relevant materials and resources; offering professional development for language teachers on environmental issues; and promoting environmental literacy programs at all educational levels (Nur et al., 2022). Other research finds that Digital Storytelling (DST) can serve as effective and authentic material for environmental education, highlighting

its potential as a powerful tool in campaigns against environmental degradation (Putri, 2018). To increase students' awareness, Project Based Learning (PBL) can also be implemented at school (Kurniawan & Salsabilla, 2022). This approach involves creating projects while reinforcing knowledge and green awareness throughout the process. To develop students' knowledge of environmental issues, giving them training is also effective. Veronika & Yani, (2024) claim that to help keep the environment clean and sustainable, schools can engage in several training practices in recycling, reusing, reducing, and replanting, and that these actions can significantly benefit the environment.

Although all parties agree that environmental literacy is crucial knowledge for Indonesian students and has been introduced in a large number of schools, students' environmental sensitivity is still low (Laaloua, 2022; Nursa'adah et al., 2021). There are still many challenges, such as scarce resources, inadequate teacher training, and resistance to change, that can hinder progress (Adnyana et al., 2023). Another study conducted by Husin et al., (2023) reveal several challenges, such as insufficient funds for the provision and upkeep of infrastructure and facilities, inadequate incorporation of environmental awareness into school curricula, varied student perceptions, and a lack of training. Teachers' beliefs, students' environmental behavior, and the lack of support for the curriculum are also found to be challenges in enhancing students' awareness of the environment (Putri, 2023).

Teachers can use creative and interactive teaching methods to help students appreciate the significance of caring for others and the environment well as emphasizing their role as change agents (Aziz, 2023). Most teachers concur that the extent to which environmental awareness and knowledge are integrated into the curriculum is moderately low and insufficient to adequately address the needs of learners (Laaloua, 2022). Research conducted in a school in Indonesia by (Husin et al., 2020) finds that teachers generally hold highly positive views regarding environmental education, encompassing their knowledge, perspectives, attitudes, behaviors, expectations, and evaluations related to environmental care education. Gunansyah et al., (2022) on the other hand, claim that although teachers can demonstrate environmentally friendly practices in schools, they need to better recognize the significance of fostering critical environmental education, engaging in outdoor learning, addressing collective environmental issues, and tackling socio-ecological challenges.

To instil a sense of responsibility, teachers should model these values in their daily lives. Both current teachers and preservice teachers need to have a positive attitude toward green education. Preservice teachers are students undergoing education and training to become teachers. They participate in teacher preparation programs that involve coursework and supervised teaching experiences, aimed at preparing them for their future careers as teachers. Media Nusantara Citra University (MNC) University is one of the educational institutions that pays serious attention to environmental problems. Therefore, the future teachers graduating from this university are expected to take part in propagating sustainable environmental awareness.

Green education is crucial in the face of growing environmental issues such as climate change and pollution. This research investigates how preservice teachers perceive and implement green education, an essential component for fostering a sustainable future. A study on perception needs to be conducted since it can guide how they integrate environmental topics into their future teaching. By conducting this research, the university will gain a portrait of how its students perceive green education, which will subsequently influence teaching practices at the university.

METHODS

The initial step in data collection involved identifying the necessary information to ensure that the research questions were adequately addressed. The researcher employed an interview method to gather data, with the interview questions adapted from Hutchinson & Waters (1987). The interview comprised eleven questions, and to facilitate accurate transcription, the sessions were video recorded with the participant's consent. Each interview lasted approximately fifteen minutes, and the data collected were transcribed into interview transcripts.

After recording the interviews, the researcher played back the video recordings and manually transcribed the content to ensure accuracy. Following the transcription, the researcher employed axial coding, a method focused on identifying core themes and the relationships between them, to analyze the data in depth. Through this process, key themes that emerged from the interviews were identified, and a thematic analysis was conducted to highlight important aspects conveyed by the participants. This involved labeling the data to better understand participants' intentions and to form initial interpretations.

The organized data were then interpreted and reflected upon both interpretively and reflexively. The findings were presented in the results section, where the sorted data were focused on addressing the research questions. Key points were further elaborated upon in the discussion, where interpretations and reflections were detailed. Finally, the data were analyzed about relevant literature, providing a comprehensive understanding of the research findings

RESULT AND DISCUSSION

In this section, the researcher provides a detailed analysis of the collected data, focusing on preservice students' perceptions regarding the implementation of green education in schools. The findings from each interview are presented according to themes, based on the responses from six participants.

Result

The findings from the interviews with six preservice teachers from the English Department of MNC University are presented in this section. The first question aims to explore the preservice teachers' knowledge of green education. The following table presents the results of the first question

Table 1. Knowledge of Green Education

No.	Respondents' Code	Respondent's Response
1.	PS1	I know about green education from the lecturer's explanation in class. Green education aims to introduce students to the importance of world sustainability.
2.	PS2	I know about the green environment from school. I also became a respondent for a friend at my university who conducted a mini research project on this topic. Green education teaches students how to increase their awareness of environmental issues by showing them pollution, global warming, natural disasters, and ways to minimize them.
3.	PS3	The first time I learned about green education was from the internet. Green education involves incorporating environmental topics that can increase students' awareness of the environment.
4.	PS4	From what I have learned and read; green education is an effort implemented by schools to increase students' awareness of environmental sustainability.
5.	PS5	The school where I conduct my teaching practice implements green education. Green education involves green learning, where teaching and learning are not limited to the main subject. For example, teaching English also includes teaching the importance of keeping the environment.
6.	PS6	I learned about green education from the internet. Green education is a concept that involves knowledge about the environment and what is happening to it now.

Based on the preservice teachers' answers, it can be concluded that all of them comprehend what green education is. As seen in Table 1, they understand the basic concept of green education, which aims to nurture a sense of empathy and connection with nature, inspiring students to cultivate a profound respect for the environment and its creatures. It is also found that their understanding of the concept of green education comes from different sources, such as learning in universities, peers, the schools where they conduct teaching practice, and the internet.

The second interview question explores the implementation of green education at the schools where the participants conducted their teaching practice. All participants carried out this practice in secondary schools for five months as part of a program called *Praktik Pengalaman Lapangan*, which is included in the English department curriculum

Table 2. The Implementation of Green Education

No.	Respondents' Code	Respondent's Answers
1.	PS1	I joined a teaching practice at a school that implements green education. The activities include daily class cleaning schedules and a Clean Friday program to preserve the school environment. These activities are effective because they instill good habits in students.
2.	PS2	I did my teaching practice at a school that has implemented green education. One way they implement green education is through projects that involve recycling waste into valuable items and showcasing them to the school community in a small exhibition. In my opinion, this is effective because the activity is interesting.
3.	PS3	The school where I did my teaching practice has already implemented green education. While I was teaching there, they held seminars about global warming for the students. However, these seminars are not very effective because they are not part of a continuous program. Green education would be more effective if the programs were conducted continuously.
4.	PS4	During my 5-month teaching practice, the school had already implemented green education. Students were allowed to study outdoors, and teachers created works of art from nature, which were later used as learning materials or decorations.
5.	PS5	I joined the teaching practice at a school that implements green education. One of their green school programs involves asking students to bring plants from home and put them in the school. They have to put their name on the vase of their plant and ensure it grows well. The purpose is to teach students how to care for their environment. However, this program is not very effective because they don't provide complete information about the purpose of these activities to the students.
6.	PS6	The school where I joined the teaching practice has green education programs. The program includes recycling unused

items and displaying pictures, stickers, and pamphlets to remind students of the importance of environmental sustainability. The school also enhances the environment with lots of plants and uses eco-enzyme-based antibacterial hand-washing soap. I think it's effective, especially the printed reminders about the environment.

The results of the interview show that all of the preservice teachers conduct teaching practices in schools that have already implemented green education. The implementation is carried out in several different ways, such as projects, seminars, planting trees, recycling, and using printed media to promote the importance of environmental sustainability, as well as specific school programs like daily and weekly cleaning activities. Some of them thought that this was effective. However, the key is that the clear objectives of the program must be communicated to the students, and the continuity of the program must be maintained.

The third section explores how students perceive the importance of green education at school. The results of the student's views on the significance of green education are shown in the following table.

Table 3. The Importance of Green Education

No.	Respondents' Code	Respondent's Answers
1.	PS1	Yes, green education is important because it is hoped to have a positive impact on the environment.
2.	PS2	I think it is important because involving the environment in learning signifies that we have 'environmental awareness.
3.	PS3	Yes, it is important to implement green education because it will shape the child's character within the school and the surrounding environment.
4.	PS4	Yes, it is important because in green education, students are not only provided with theories related to learning material. Students are also taught to care about the condition of the environment around them.
5.	PS5	Green education is very important to implement in schools because it helps students understand the importance of protecting the environment, teaches students to live sustainably, encourages students to become agents of change in society, and equips students with the knowledge and skills to face future environmental challenges.
6.	PS6	Students must develop a sense of environmental concern.

Regarding the importance of green education, all participants involved in this research have a positive perception of green education in schools. They agree that green education is very important to implement. The implementation of green education is expected to have a positive impact on the students and the environment. Implementing

green education in schools is a tangible step the state can take to address environmental issues like waste management, air pollution from exhaust emissions, and water contamination from household waste.

The next interview examines students' opinions on effective strategies that could be implemented in schools for green education. The interview results are presented in Table 4.

Table 4. The Effective Strategies for the Implementation of Green Education

No.	Respondents' Code	Respondent's Answers
1.	PS1	In my opinion, an effective way is by carrying out practical activities directly in the field, such as having many trash cans. Programs to recycle waste are also effective in establishing positive habits for the future.
2.	PS2	I think engaging students in practical, real-life projects is very effective. This can be done by organizing exhibitions to show recycled products to the school community.
3.	PS3	By creating interesting activities, like investigating real phenomena of environmental decay and making them into video projects.
4.	PS4	The most effective strategies to implement green education include integrating environmental issues into some subjects by using interactive and collaborative learning methods and providing environmentally friendly facilities at schools, such as recycling bins, organic gardens, and renewable energy sources.
5.	PS5	Effective strategies to implement green education involve learning directly and engaging with nature.
6.	PS6	One of the most effective strategies is to integrate environmental education into the formal curriculum. This includes not only natural science or geography subjects but also other subjects, such as English.

The interview results reveal that students have different perceptions on the effective strategies for implementing green education at school. During the interview sessions, preservice teachers mentioned some effective strategies that can be implemented. These include providing facilities to keep the environment clean, such as sufficient trash cans, conducting project-based learning related to environmental sustainability, integrating environmental issues into specific subjects, providing environmentally friendly facilities, setting students' learning in nature, and incorporating environmental issues into the curriculum. It is important to apply effective methods to achieve the purpose of green education. The implementation of these strategies must consider both human and non-human aspects at the school.

The final section uncovers preservice teachers' perspectives on potential challenges in implementing green education. The interview results are displayed in the following table.

Table 5. The Challenge to the Implementation of Green Education

No.	Respondents' Code	Respondent's Answers
1.	PS1	In my opinion, an effective way is by carrying out practical activities directly in the field, such as having many trash cans. Programs to recycle waste are also effective in establishing positive habits for the future.
2.	PS2	I think engaging students in practical, real-life projects is very effective. This can be done by organizing exhibitions to show recycled products to the school community.
3.	PS3	By creating interesting activities, like investigating real phenomena of environmental decay and making them into video projects.
4.	PS4	The most effective strategies to implement green education include integrating environmental issues into some subjects by using interactive and collaborative learning methods and providing environmentally friendly facilities at schools, such as recycling bins, organic gardens, and renewable energy sources.
5.	PS5	Effective strategies to implement green education involve learning directly and engaging with nature.
6.	PS6	One of the most effective strategies is to integrate environmental education into the formal curriculum. This includes not only natural science or geography subjects but also other subjects, such as English.

Discussion

In the Indonesian context, the purposes of education are clearly outlined in the National Education System in Article 3 of Law Number 20 of 2003. It states that the objective of national education is to develop students' potential to become individuals who are faithful and devoted to God Almighty, possess noble character, maintain good health, acquire knowledge, demonstrate capability, exhibit creativity, remain independent, and act as democratic and responsible citizens. Furthermore, the Merdeka Curriculum emphasizes six human profiles expected to be possessed by students, called the Pancasila Students Profile. These profiles consist of global diversity, mutual support, creativity, critical thinking, independence, faith, reverence for God, and virtuous conduct. In fact, the noble values of Pancasila are currently being eroded. They are only been memorized but not properly or correctly implemented (Hazimah & Dewi, 2021). When relating the educational purpose and the Pancasila Student Profile to the awareness of environmental sustainability, there is a strong correlation, especially in possessing noble character and virtuous conduct. Regarding environmental morals, humans are required to

interact well and have a responsibility to preserve and maintain the environment. Thus, environmental awareness is necessary, and green education needs to be applied in schools in Indonesia (Álvarez-García et al., 2015).

Green education, as part of the Sustainable Development Goals (SDGs), addresses the ethical concerns of sustainable development by integrating education across different levels to influence people's lifestyles and foster responsible behaviors, ultimately contributing to a sustainable future. Green education must be integrated into the education of the younger generation. In Indonesia, one program supporting this goal has already been applied. As suggested by UNESCO, four essential pillars of transformative education lead to environmental sustainability: green schools, green curricula, green teacher training, and green communities.

As found in this research, the participants know the concept of green education. They obtain the concept from various sources, one of which is from their learning at the university. Universities that conduct teacher education programs should provide essential knowledge and skills aimed at promoting sustainable development. These encompass knowledge, skills, values, and attitudes that empower preservice teachers to lead productive lives. (Parveen & Rahim, 2022). Preservice teachers need to be equipped with these skills because, when they become in-service teachers, they will facilitate the transition toward sustainability through their teaching methods. Teachers with a solid understanding of sustainability will be better equipped to handle the dynamic nature of the world and impart to their students the essential knowledge, skills, and attitudes needed for sustainability, ultimately leading to sustainability literacy. Moreover, it is stated by (Álvarez-García et al., 2015) This highlights the crucial role of teachers in integrating green education into schools to educate future citizens about environmental issues. However, for this education to be effective, preservice teachers require proper training. This ensures that qualified professionals develop both the competencies of an environmentally educated individual and the professional skills of an educator.

A program called Adiwiyata, initiated by the State Ministry of the Environment and stemming from a joint agreement between the State Minister of the Environment and the Minister of National Education is described by government regulation as an ideal framework for acquiring knowledge, norms, and ethics that form the foundation for achieving a prosperous life and the goals of sustainable development (Murdani et al.,

2018). The primary objective of this program is to establish school institutions that are environmentally conscious and culturally aware. The programs are recognized as successfully developing students' positive attitudes toward the environment. (Muzakkir et al., 2023; Rushayati et al., 2023; Sunarto, 2023; Syahrial et al., 2020).

Green education can be implemented with non-curricular strategies that involve incorporating culture to foster positive ethical attitudes, reinforcing students' spiritual values to increase respect for nature, and enhancing students' environmental literacy by involving them in research and project-based activities (Karyanto, 2019). Implementing a green curriculum in the English classroom allows students to learn through real-life experiences by practicing their learning materials in real-world settings. Combining these opportunities with activities conducted outside the classroom provides students with meaningful language learning experiences that can enhance their English skills. Thus, a green curriculum can offer a variety of English teaching experiences. Numerous studies have been conducted on environmental education and green curriculum. They found that students developed a better understanding and connection to the world when environmental learning techniques were applied (Pondan & Leoanak, 2022). Project-based learning can facilitate student to develop their environmental awareness through green projects. Research has shown that green projects motivate students to learn more effectively and creatively (Kamil et al., 2020). These projects provide students with the flexibility to think, act, and apply various needs, abilities, and skills to address environmental challenges. Students' competencies can be enhanced through practical work, such as creating products from waste, writing articles, and participating in art training, among other activities.

To achieve the success of green education, support from all parties is needed because the challenges in implementation occur due to various factors that are in line with the responses of preservice teachers in this study. The first is the insufficient attention from both local and central governments toward environmental education (Argawati & Suryani, 2020). In the implementation of green education, governments are required to establish policies and legislation requiring environmental education in schools, ensuring it becomes a standardized component of the curriculum. Unfortunately, in the Indonesian context, there is still clear regulation on it. There is a lack of a standardized and structured curriculum that restricts the consistent implementation of green education across all

educational levels. Additionally, the absence of specific assessment methods for environmental learning creates challenges in evaluating student comprehension. Moreover, there are significant disparities in infrastructure and access to educational resources between urban and rural areas, with remote regions often struggling to obtain current educational materials and technologies necessary for effective green education. This issue is further complicated by Indonesia's diverse cultural landscape, which necessitates a curriculum that is sensitive to various cultural beliefs and practices.

The next challenges that may arise include limited budget allocations for education, which hinder the development of comprehensive environmental education programs, resource materials, and the training of educators. (Zhao et al., 2023). The huge need budget for green education especially will be utilized in professional development programs to equip educators with the knowledge and skills to effectively teach environmental topics. This includes training workshops, seminars, and ongoing support. Green education may necessitate upgrades to school facilities to promote sustainable practices, including the installation of energy-efficient systems, the implementation of recycling programs, and the incorporation of green building features.

CONCLUSION

Environmental education for the younger generation is a tangible solution to mitigate environmental damage. Schools serve as pivotal learning centers that offer environmental experiences, impart knowledge, and foster a sense of environmental awareness. Preservice teachers are the agents who will teach students and thus must possess sufficient knowledge, skills, and a positive perception of the implementation of green education. This research highlights the need for increased support and resources for green education, which could lead to more effective implementation and greater environmental impact. To enhance the effectiveness of green education, it is recommended that policymakers develop comprehensive training programs for teachers, provide resources, and establish partnerships with environmental organizations.

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REFERENCES

- Adnyana, I. M. D. M., Mahendra, K. A., & Syed Meesam Raza. (2023). The Importance of Green Education in Indonesia: An analysis of Opportunities and Challenges. *Education Specialist*, 1(2), 61–68. <https://doi.org/10.59535/es.v1i2.168>
- Aggarwal, D. (2023). Green Education: A Sustainable Development Initiative with the Power of Artificial Intelligence (AI). *Journal of Image Processing and Intelligent Remote Sensing*, ISSN, 2815-0953. <https://doi.org/10.55529/jipirs.35.39.44>
- Álvarez-García, O., Sureda-Negre, J., & Comas-Forgas, R. (2015). Environmental education in pre-service teacher training: A literature review of existing evidence. *Journal of Teacher Education for Sustainability*, 17(1), 72-85. <https://intapi.sciendo.com/pdf/10.1515/jtes-2015-0006>
- Annisa Salsabilla, M. (2022). Implementation Of Environmental Education in The Natural School Curriculum. *Journal Learning Geography*, 1(1), 1-9. <http://repository.lppm.unila.ac.id/id/eprint/42402>
- Argawati, N. O., & Suryani, L. (2020). Project-Based Learning in Teaching Writing: The Implementation and Students' Opinion. *English Review: Journal of English Education*, 8(2), 219-226. <https://doi.org/10.25134/erjee.v8i2.2120>
- Arlinghaus, K. R., & Johnston, C. A. (2018). Advocating for behavior change with education. *American journal of lifestyle medicine*, 12(2), 113-116. <https://doi.org/10.1177/15598276177454>
- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Boston, MA: Pearson.
- Efiariza, R. R., Dewi, O. C., Panjaitan, T. H., & Felly, R. (2021). The green-based school and the creation of student's environmental attitude and behavior. *ARTEKS: Jurnal Teknik Arsitektur*, 6(2), 249-258. <https://doi.org/10.30822/arteks.v6i2.715>
- Gunansyah, G., Ariadi, S., & Budirahayu, T. (2022). Responses to the Socio-Ecological Crisis: Perceptions of In-Service Teacher. *Journal of Education Research and Evaluation*, 6(4), 653–666. <https://doi.org/10.23887/jere.v6i4.49920>
- Hazimah, G., & Dewi, D. (2021). Upaya Memajukan Pendidikan Indonesia Berdasarkan Nilai-Nilai pancasila. *Edusaintek: Jurnal Pendidikan, Sains Dan Teknologi*, 8(1), 149-160. <https://doi.org/10.47668/edusaintek.v8i1.120>
- Husin, A., Maharani, S. D., & Sumarni, S. (2020). Teachers' perceptions of environmental care education in elementary schools. *Creative Education*, 11(09), 1802. <https://doi.org/10.4236/ce.2020.119132>
- Hutchinson, T., & Waters, A. (1987). *English for Specific Purposes: A Learner-Centered Approach*. Cambridge: Cambridge University Press. <http://dx.doi.org/10.1017/CBO9780511733031>
- Kamil, P. A., Putri, E., Ridha, S., Utaya, S., & Utomo, D. H. (2020, May). Promoting environmental literacy through a green project: a case study at adiwiyata school in Banda Aceh City. In *IOP Conference Series: Earth and Environmental Science* (Vol. 485, No. 1, p. 012035). IOP Publishing. <https://doi.org/10.1088/1755-1315/485/1/012035>

- Laaloua, H. (2022). Teachers' perceptions of the integration of environmental awareness and knowledge in high school curricula in Morocco. *International Journal of Social Science and Human Research*, 5(5), 1751-1764. <https://doi.org/10.47191/ijsshr/v5-i5-25>
- Leoanak, S. P. (2022). Developing Reading Skills Through Green Curriculum Implementation as an Instructional Model. *Acitya: Journal of Teaching and Education*, 4(1), 69–79. <https://doi.org/10.30650/ajte.v4i1.3193>
- Maurya, P. K., Ali, S. A., Ahmad, A., Zhou, Q., Castro, J. D. S., Khan, E., & Ali, H. (2020). An introduction to environmental degradation: Causes, consequence and mitigation. *Environmental degradation: causes and remediation strategies*, 1, 1-20. <https://doi.org/10.26832/aesa-2020-edcrs-01>
- Murdani, D., Hakim, A., & Yanuwidi, B. (2018). Strategies of regency adiwiyata (green) school management at secondary education level in sintang regency. *Indonesian Journal of Environment and Sustainable Development*, 9(2). <https://doi.org/10.21776/ub.jpai.2018.009.02.07>
- Muzakkir, M., Novalita, R., & Dewi, S. L. (2023). Implementation of Caring For the Environment Green School in North Aceh District–Indonesia. *Sumatra Journal of Disaster, Geography and Geography Education*, 7(1), 65-69. <https://doi.org/10.24036/sjdgge.v7i1.439>
- Nur, S., Anas, I., & Pilu, R. (2022). The Call for Environmentally-Based Language Teaching and Green Pedagogy: Climate Actions in Language Education. *Elsya : Journal of English Language Studies*, 4(1), 77-85. <https://doi.org/10.31849/elsya.v4i1.9526>
- Nursa'adah, E., Maryani, B., & Ruyani, A. (2021). Students' environmental literacy: Environment education assisted e-booklet on biodiversity Gegas Dam Indonesia context. *Thabiea: Journal of Natural Science Teaching*, 4(2), 159-169. <http://dx.doi.org/10.21043/thabiea.v4i1.11599>
- Putra Arie Gayo, A. (2023). Urban Heat Island pada Kota Industri. *Edusaintek: Jurnal Pendidikan, Sains Dan Teknologi*, 10(1), 212-220. <https://doi.org/10.47668/edusaintek.v10i1.642>
- Putri, I. G. A. P. E. (2018). Critical environmental education in tertiary English language teaching (ELT): A collaborative digital storytelling project. *Indonesian Journal of Applied Linguistics*, 8(2), 336-344. <https://doi.org/10.17509/ijal.v8i2.13280>
- Putri, M. R. N. (2023). Major Challenges of Teachers Implementing Nature-Based Education Concept Secondary School Students In Indonesia: Tantangan Utama Guru Menerapkan Konsep Pendidikan Berbasis Alam Siswa Sekolah Menengah Di Indonesia. *Journal of Social and Political Science Society*, 2(1), 76–83. <https://doi.org/10.58330/society.v2i1.266>
- Robbi, I., Ismail, M., & Hoetoro, A. (2020, June). Environmental Degradation in Indonesia 1969–2016. In *23rd Asian Forum of Business Education (AFBE 2019)* (pp. 352-356). Atlantis Press. <https://doi.org/10.2991/aebmr.k.200606.061>
- Rushayati, S. B., Hermawan, R., & Ginoga, L. N. (2023). The role of adiwiyata school in the change of students' knowledge, attitude, and behavior towards the environment.

Jurnal Pengelolaan Sumberdaya Alam dan Lingkungan (Journal of Natural Resources and Environmental Management), 13(1), 122-128.
<https://doi.org/10.29244/jpsl.13.1.122-128>

- Sahri, S., & Aziz, S. U. (2023). The Role Of Islamic Education Teachers In Increasing Social Awareness And Environmental Awareness In The Young Generation. *AL-WIJDÁN: Journal of Islamic Education Studies*, 8(4).
<https://repository.unugiri.ac.id:8443/id/eprint/4732>
- Saprodi, E., Kastolani, P. W., & Ningrum, E. (1864). Integration of Environmental Education in Eco Pesantren Daarut Tauhiid Bandung. *International Summit on Science Technology and Humanity*, 713–720. <http://hdl.handle.net/11617/11836>
- Sunarto, S. (2023). Environmental Literacy and Care Behavior Through Adiwiyata Program at Elementary School. *Al-Ishlah: Jurnal Pendidikan*, 15(3), 3040-3050.
<https://www.journal.staihubbulwathan.id/index.php/alishlah/article/view/3887>
- Syahrial, S., Asrial, A., Sabil, H., & Arsil, A. (2020). Effectiveness of Adiwiyata in the character of caring for the environment of students. *Humanities & Social Sciences Reviews*, 8 (2), 109-115. <https://doi.org/10.18510/hssr.2020.82.e13>
<https://doi.org/10.18510/hssr.2020.82e13>
- Veronika, E., & Yani T, A. (2024). The Implementation of the Green School Model in Shaping Sustainable Lifestyles. *Jurnal Indonesia Sosial Sains*, 5(06), 1292–1297.
<https://doi.org/10.59141/jiss.v5i06.1129>
- Zhao, Y., Kong, X., Ahmad, M., & Ahmed, Z. (2023). Digital economy, industrial structure, and environmental quality: Assessing the roles of educational investment, green innovation, and economic globalization. *Sustainability*, 15(3), 2377.
<https://doi.org/10.3390/su15032377>