



## The internalization of school environmental care through *Adiwiyata* program

Lailatus Saadah\*

\* Pancasila and Civic Education Department, Universitas Sebelas Maret, Indonesia

[lailatussaadah81@gmail.com](mailto:lailatussaadah81@gmail.com)

Rusnaini

Pancasila and Civic Education Department, Universitas Sebelas Maret, Indonesia

[rusnaini@staff.uns.ac.id](mailto:rusnaini@staff.uns.ac.id)

Moh. Muchtarom

Pancasila and Civic Education Department, Universitas Sebelas Maret, Indonesia

[muhtarom1974@gmail.com](mailto:muhtarom1974@gmail.com)

\*Corresponding Author

### Article History

Submitted : 27-12-2022

Revised : 14-01-2023

Accepted : 03-04-2023

Published : 31-10-2023

### Article Link

<https://journal.uny.ac.id/index.php/civics/article/view/56549>

### Abstract

Low levels of education impact a lack of understanding of the environment importance. One serious effort to increase awareness of environmental protection and management is through the world of education, both formal and non-formal education. Schools become a forum for conducting environmental education through holding environmentally friendly schools. This research aims to analyze the internalization of environmental care in schools through the *Adiwiyata* program. This research uses a qualitative approach. The location of the study was at Junior High School 1 Panawangan Grobogan. Researchers collected data through observation, interviews, and documentation methods. Interviews were conducted with the civic education teacher, six students, the school principal, and the chief coordinator of the *Adiwiyata* program. Data reduction, data presentation, and conclusion drawing were carried out by researchers as data analysis techniques. This research shows that internalizing environmental care can be done by implementing the components of the *Adiwiyata* program at Junior High School 1 Panawangan. Apart from that, the program is also supported by strengthening civic disposition given to Civics subjects. The *Adiwiyata* program combines learning and action that effectively changes student behavior to be more participatory in protecting the environment. This research has implications for schools to be able to collaborate with external parties such as environmental agencies, NGOs and environmental communities to increase students' understanding of current ecological issues. This collaboration can involve outreach activities, field trips, and environmental projects that actively involve students.

**Keywords:** *Adiwiyata* program; civic disposition; value internalization

### Introduction

Technological advances impact natural resource management, which can simplify this process (Deswanto, 2022; Zhu, 2023). Unfortunately, people in many parts of the world seem to act slowly. This condition also shows that they did not understand and deny the importance



of the environment (Voulvoulis & Burgman, 2019; Yuan et al., 2023). In Indonesia, people's awareness of protecting nature has yet to be fully embedded in their lives. In 2021, there were 5,402 natural disasters in Indonesia. These disasters were dominated by 1,794 floods, 1,577 extreme weather, 1,321 landslides, 579 forest and land fires, 91 tidal waves and abrasion, 24 earthquakes, 15 droughts, and one volcanic eruption disaster. Therefore, we need to save the environment from damage to reduce the ecological crisis in Indonesia. However, some people still disregard the natural environment, such as throwing rubbish carelessly (Jumirah et al., 2021).

According to Setianingsih (2023), low levels of education influence the level of environmental awareness. Apart from that, the low economic level makes people exploit the environment around them to meet their needs (Chu & Karr, 2017). This condition is a factor in the low public concern for the environment. Besides that, providing understanding regarding environmental awareness is not an easy thing because of the diverse cultures of society (Wahidin, 2019). Based on Law No. 32 of 2009 concerning environmental protection and management, article 70, paragraph (1) emphasizes that the community has the same and broadest rights and opportunities to play an active role in environmental protection and management. In other words, as Indonesian citizens, we are expected to participate in protecting and managing the environment.

Research by Kang & Hong (2021) shows that environmental education is closely related to ecological problems involving various values and viewpoints. Therefore, education is a step toward increasing understanding and awareness of environmental protection and management, especially for students at school (Damoah & Omodan, 2022; van de Wetering et al., 2022). Schools are the right place for the implementation of environmental education. This is because students are the young generation who are expected to be able to make changes by being directly involved and being able to face the environmental crisis (Gugssa, 2023; Zikargae et al., 2022). The school curriculum includes an environmental education policy in South Africa (Damoah & Omodan, 2022). However, in its implementation, schools rarely have environmental education policies in the curriculum. In the Republic of Macedonia, deficiencies in the field of environmental education range from teaching programs with environmental elements in schools to the level of students' environmental awareness (Srbinovski et al., 2014). Piras et al. (2023), show that learning related to environmental awareness in Italian schools only reduces the problem of food waste in the short term. So, the impact will only last for a while. In Indonesia, environmental education is implemented through environmentally friendly schools with the *Adiwiyata* program (Pelita & Widodo, 2020; Wardani, 2020).

Several previous studies emphasized environmental education in the curriculum, learning, and development of school culture (Damoah & Omodan, 2022; Mazloumiyan et al., 2012; Piras et al., 2023; Srbinovski et al., 2014). Meanwhile, to be able to increase awareness of the environment, good character is needed. This character can support students as the younger generation in reducing long-term environmental problems (Halimah & Anisah, 2018; Halimah & Nurul, 2020). Based on Minister of Education and Culture Regulation No. 20 of 2018 concerning strengthening character education in formal education units, there are 18 character values developed in schools, namely (1) religious, (2) honest, (3) tolerance, (4) discipline, (5) cooperation, (6) creative, (7) independent, (8) democratic, (9) curiosity, (10) national spirit, (11) love of the country, (12) respect for achievements, (13) friendship, (14) love of peace, (15) like reading, (16) care about the environment, (17) cares about social issues, and (18) responsibility. These character values are developed to strengthen student character.

In supporting this character, Pendidikan Pancasila dan Kewarganegaraan, known as Civic Education subjects, has an important role. This subject focuses on skills and values, namely civic character (Japar & Fadhillah, 2018). The aim of civic education learning also focuses on the civic disposition component. Civic disposition is closely related to developing the character of citizens both privately and publicly. This character leads to moral responsibility, self-discipline, respect for dignity, concern as a citizen, and critical thinking (Mulyono, 2017). Therefore, this

*Adiwiyata* program aims to strengthen students' civic disposition. This is because the *Adiwiyata* program was prepared by the government to create awareness and disciplined responsibility of students towards the environment (Fahlevi et al., 2020). Therefore, students can become agents of change who care about environmental sustainability and implement the principles of preserving the ecosystem (Tikho & Gunansyah, 2021)

One school with an *adiwiyata* program is Junior High School 1 Panawangan, Grobogan Regency, Central Java. Researchers observed several problems related to the requirement of serious attention. Phenomena such as littering, damaging school facilities, and destroying trees in schools show a lack of concern for the environment in the school. Therefore, the role of teachers as coaches and mentors is necessary to increase students' environmental awareness through the *Adiwiyata* program. Considering that the active role of all school members is important to create a good educational environment, instilling character values is needed and can be a priority. The urgency of this research is that increasing environmental awareness among students is important. Thus, this research aims to analyze efforts to internalize school ecological care through the *Adiwiyata* program to strengthen civic disposition. The novelty of this research lies in the support of teachers as school members in developing students at school.

## Method

This research uses a qualitative approach to explain the results of the analysis of efforts to internalize environmental care in schools through the *Adiwiyata* program as a strengthening of the civic disposition. Thus, the data obtained in this research is related to the internalizing environmental care values carried out by civic education teachers to students through the *Adiwiyata* program. Researchers chose Junior High School 1 Penawangan as the research location because the school has an *Adiwiyata* program. Researchers have two data sources: primary data (observation and in-depth interviews) and secondary data obtained from documentation (Miles et al., 2018). Participants in this research were one civic education teacher, the school principal, the head of the *Adiwiyata* program coordinator, and six students in grade 7. In selecting participants, the researcher used a purposive sampling technique. Thus, participants are selected according to research needs, namely being able to provide information related to the research problem (Miles et al., 2018; Saldaña, 2013).

Researchers carried out data collection techniques with in-depth interviews, observation, and documentation. In this research, the interview technique used was a semi-structured interview. Researchers use interview guidelines, but in the process, they develop according to the data needed. This interview process took 60 to 90 minutes for each participant. The interview activities were scheduled based on the participants' availability to ensure that the learning process was not disrupted. For students, the interview process was carried out after they had finished the learning or after school. The interview locations were in the teacher's, principals, and classroom. The researcher chose this space to make the interview process more conducive. The researcher used a smartphone and tape recorder as recording tools in the interview process. The researcher also made small notes regarding important things conveyed by the informant. Interview activities were carried out one to two times depending on the clarity of the information provided and the data required by the researcher.

Meanwhile, the observations carried out by researchers were observing directly and recording phenomena that occurred in the field related to 1) the implementation of the *Adiwiyata* program at Junior High School 1 Penawangan, namely classroom learning, and 2) familiarization activities related to the *Adiwiyata* program, which are carried out outside the classroom. Apart from that, researchers also observed the state of the school environment, the condition of teachers and students, the attitudes of teachers and students toward the environment, and the guidance provided by teachers to students. The results of this observation were in the form of notes related to the implementation of the internalization of environmental care values described by the researcher. Researchers also carried out documentation to collect data related to *Adiwiyata* program activities, greenhouses, green school schedules, waste management processes, and documents related to learning.

On the other hand, researchers tested the validity of the data using triangulation techniques. This research used source triangulation by comparing data between teachers, school principals, and students. Meanwhile, method triangulation was done by comparing interview results with observations to obtain the correct information. Data analysis has three steps: reduction, display, and conclusion drawing/verification (Miles et al., 2018). In the first step, researchers selected data on internalizing the value of caring for the environment. Thus, researchers sort out the parts of the coded data and the discarded data. In the second step, the researcher presents the data as a collection of information related to the findings obtained. The data is presented in short descriptions, charts, relationships between categories, and the like. In the third step, the researcher draws conclusions supported by valid and consistent data evidence.

## Result and Discussion

Developing students' character to have environmental awareness is a challenging thing. To support the running of the *Adiwiyata* program, a role for teachers, including civic education teachers, in educating the younger generation is needed. Thus, teachers were directed to develop and instill environmentally caring character values in students. Both processes are carried out by internalizing the value of caring for the environment. When the interview was conducted, the researcher asked questions regarding the internalization process carried out by the civic education teacher.

"Generally, students are less interested in explaining material conceptually regarding the internalization of environmental care values. So, I provide examples of behavior that cares about the environment. For example, behavior in using water must be adjusted to applicable norms. After providing these examples, students were allowed to share their experiences related to environmental problems and their solutions" (Interview with civic education teacher, SR, April 2023).

"In the learning process, we always given motivation, one related to protecting the environment. Before learning took place, the teacher directed us to look at the table. If there is rubbish, we must throw it in the trash. Then, the teacher reminded us to protect the environment" (Interview with the student, SA, April 2023).

Based on the interview results shows that there is an internalization of values carried out by teachers toward students regarding caring for the environment. Even though civic education learning leads to conceptual and rote memorization, the *Adiwiyata* program developed through teaching and learning activities can encourage students to care about the environment. This is demonstrated through the material presented by the civic education teacher. Students were also invited to take action to protect the environment, starting with small things such as checking each table to see whether there was rubbish. The form of instilling environmentally caring character provided by teachers is providing motivation and moral responsibility. Motivation is a source that gives students the strength and enthusiasm to be able to do something seriously (Kabunggul et al., 2020). Next, the researcher asked about the attitudes teachers need to internalize the values of caring for the environment.

"Teachers can internalize the value of caring for the environment by setting an example for students and maintaining their behavior. However, this is not only done by teachers, including me as the principal and other school people. Thus, maintaining the cleanliness of the school environment is the duty of all community in the school." (Interview with school principal, P, April 2023).

"It is common for students to use too much water when washing their hands. So, I was reprimanded and gave an example to students on how to use water sparingly. Because just reprimanding students, they will not understand it enough." (Interview with civic education, SR, April 2023).

The results of these interviews show that students' environmental care can grow by inviting them to do it directly. Apart from that, environmental protection activities were the

responsibility of students and the entire school community. During the learning process, the researcher made careful observations. The topics given by civic education teachers to students are the meaning of norms, sources of norms, types of norms, and sanctions for violating norms. The teacher explained the topics and then developed and linked them to environmental education. The *school's adiwiyata program* was in line with the basic norms of togetherness, openness, equality, honesty, justice, and preservation of the function of the environment and natural resources.

"Not all subject matter can be linked to environmental care or the *Adiwiyata* program. However, every teacher at this school is generally directed to motivate students to protect the environment by not littering. Different from civic education subjects. The civic education material contains norms and civic disposition topics that align with the *adiwiyata* program. Thus, students gain an understanding related to the values of caring for the environment." (Interview with school principal, P, April 2023).

"In the learning process related to norms, as a student, I was allowed to convey matters related to protecting the environment by the teacher, such as when a classmate was not carrying out their picket duty cleaning the class. I relate this condition to the norm material. Then, the teacher and students discussed what sanctions should be given. Even though my friends initially did not support it, the results of discussions regarding the sanctions made them diligent in carrying out pickets." (Interview with the student, SP, April 2023).

The value transaction stage is a value process using two-way communication, or interaction between students and teachers, which is a reciprocal interaction to increase their value of caring for the environment. In SMPN 1 Penawangan, there was an obligation for all students to picket cleaning the classroom after school hours were over. Students are also divided according to the day and groups available. In carrying out the learning process regarding norms, civic education teachers direct students to collect information related to Law No. 32 of 2009 concerning environmental protection and management, Law No. 18 of 2008 concerning waste management, Law No. 41 of 1999 concerning forestry, and Law No. 23 of 1997 concerning environmental management. Based on the results of observations, students' enthusiasm was shown by their activeness in collecting information and then exchanging information. Then, the researcher asked about learning activities with the Adiwiyata program.

"Civic education learning becomes interesting and fun. We did not just discuss traffic issues. The teacher allowed us to learn more about environmental protection and management. Apart from that, we also have to relate the topic of norms to the specified regulations. There were still many people who did not care about the environment. Through the information gathered, I realized that protecting the environment is very important." (Interview with the student, SP, April 2023).

"The civic education learning process with this theme made me understand regulations related to the environment. Since then, I started saving electricity at home by turning off the lights when they were not needed, unplugging my cell phone charger when I was not using it, and saving water. Even though my behavior was still relatively small effect, I try to help protect the environment." (Interview with the student, SS, April 2023).

The interview results illustrate that students were enthusiastic about learning using the *Adiwiyata* program. The conditions demonstrated by the students align with the process of internalizing about the good character where students have good knowledge of environmental management and protection (Lickona, 1999). The knowledge results during the learning process create a commitment to this goodness. SP and SS demonstrated this as students. And finally, students did a good character by helping to protect the environment. After that, the researcher asked about the *school's Adiwiyata program*. In implementing environmental care in schools, we used four components of the *Adiwiyata* program. The school has an environmentally friendly policy, implements an environmentally based curriculum, participatory ecological activities, and manages environmentally friendly supporting facilities. One of them is getting used to maintaining the cleanliness and sustainability of the school

environment, namely carrying out picket duties to clean the classroom. At the beginning of every lesson, students must check their study desks and the entire classroom for cleanliness (Interview with the *Adiwiyata* program coordinator, KP, May 2023). The interview results were in line with what was conveyed by the students that the *Adiwiyata* program internalizes environmental care in schools.

The research findings show that the process of internalizing environmental care carried out by Junior High School 1 Penawangan is implementing the components of the *Adiwiyata* program. The program was also supported by strengthening civic disposition given to civic education subjects. Thus, this *Adiwiyata* program combines learning and action that effectively changes behavior. However, this study needed to align with (Zikargae et al., 2022), where project-based learning is suggested as an empowerment tool to improve environmental challenges. Students need a complete understanding of the living environment for project-based learning. There must be more than the ecological insight policy component to encourage students to care about the environment.

For this reason, the combination with the *Adiwiyata* program is a step that schools can take to increase students' awareness of the environment. This research also answers (Gugssa, 2023) concerns about teaching environmental topics. The *Adiwiyata* program encourages students to protect the environment in a participatory manner as a form of environmental management training. In line with (Damoah & Omodan, 2022), not all schools can implement environmental education policies in the learning curriculum. This is because not all subjects can be adapted to this material. However, this research offers an *Adiwiyata* program where schools can implement an environment-based curriculum with appropriate subjects. Schools can also implement a policy where every student and teacher conducts a cleanliness check before class starts.

The implementation of the *Adiwiyata* program at Junior High School 1 Penawangan is proven by the school's vision, mission, and goals, which have nuances of love for nature and environmental awareness regulations. Schools must implement environmentally friendly practices in daily activities, such as recycling waste, efficient use of water and electricity, and adopting a healthy and clean lifestyle. In addition, schools participating in the *Adiwiyata* program provide unique learning about environmental issues, such as nature protection, waste management, energy savings, and greening efforts. This material was integrated into the existing curriculum to become part of a continuous learning process and is carried out every time teaching and learning activities occur. Teachers from various subjects incorporate environmental elements into learning materials so that students can see the connection between issues and the environment.

The *Adiwiyata* program encourages students' participation in various environmental activities, such as tree planting, environmental cleanup activities, and environmental awareness campaigns. By being directly involved, students will better appreciate the value of caring for the environment. The value of caring for the environment is introduced to students through various *Adiwiyata* activities, such as introducing the importance of protecting the environment, getting used to waste management, and participating in school and environmental cleanup activities. Senior High School 1 Penawangan School holds training, workshops, and field visits to strengthen students' understanding of the importance of protecting the environment. The school also involves students in managing the school garden and tree planting activities as part of environmental awareness.

The *Adiwiyata* program carried out by schools is a strategy to change students' knowledge of the environment. In addition, realizing environmental awareness in schools requires the cooperation of school residents in protecting and managing the environment. Thus, civic education subjects are one of the subjects that can implement an environment-based curriculum by instilling character and behavioral values in students. This research has also attempted to apply the character values of discipline, cooperation, environmental care, and

responsibility. Apart from that, infrastructure supporting *adiwiyata* program activities means school can manage this infrastructure to maintain and be environmentally friendly. Classrooms, school gardens, and school facilities are among the facilities that are kept clean so that they remain well maintained. To maintain the cleanliness of existing school facilities and infrastructure, rubbish bins have been installed on each side. The internalization of an attitude of caring for the environment through the *Adiwiyata* program can run well, inseparable from the school community's participation, especially teachers and school staff. Teachers and school staff act as role models in implementing environmental care values. This attitude is expected to become a role model for students. When students see a green and clean school environment and find teachers and staff who care about the environment, they will be more motivated to follow suit. Teachers at school have played a very active role in helping students internalize the values of caring for the environment. By recognizing students' potential, encouraging students' active participation, and practicing environmentally caring values, the process of internalizing values can be more effective and positively impact students' environmentally caring character.

Based on the research results, the values of civic disposition that also emerged and developed as the implementation of the *Adiwiyata* program activities progressed, namely the character of caring, especially for the environment, responsibility, honesty, religion, cooperation, discipline, obeying social rules, aware of rights and obligations, nationalist, and intelligent.

## Conclusion

This research concludes that the internalization of ecological care through the *Adiwiyata* program is carried out with four *Adiwiyata* components, namely environmentally friendly policies, implementation of an environmentally based curriculum, participatory environmental activities, and management of ecologically friendly supporting facilities. The internalization process is carried out using a combination of learning and actions by civic education teachers. The results of this research contribute to validating the theory about internalizing the value of caring for the environment through a civic education learning approach. Civic education can be a subject that can be interesting for students in understanding the environment. Apart from that, participatory-based environmental activities carried out by students also do not escape the teacher's example and the cooperation of the school community in protecting the environment. Therefore, this research can enrich civic education theory by improving the understanding of the importance of forming civic dispositions in creating citizens who care about the environment. Thus, civic education learning that is well designed and integrated with the *Adiwiyata* program has a real impact in forming students' characters who care about the environment. This can be an example of other schools adopting a similar approach to teaching environmental values. This research has implications for schools to be able to collaborate with external parties such as environmental agencies, NGOs, and environmental communities to increase students' understanding of more current and in-depth ecological issues. This collaboration can involve outreach activities, field trips, and environmental projects that actively involve students.

## References

- Chu, E. W., & Karr, J. R. (2017). Environmental impact: Concept, consequences, measurement in *reference module in life sciences*. Elsevier. <https://doi.org/10.1016/B978-0-12-809633-8.02380-3>
- Damoah, B., & Omodan, B. I. (2022). Determinants of effective environmental education policy in South African schools. *International Journal of Educational Research Open*, 3, 100206. <https://doi.org/10.1016/j.ijedro.2022.100206>
- Deswanto, V. (2022). Literature review: Green accounting Era 4.0 menuju Society 5.0. *Jurnal Riset Akuntansi Dan Manajemen Malahayati*, 11(2), 42–48. <https://doi.org/10.33024/jrm.v11i2.7213>

- Fahlevi, R., Jannah, F., & Sari, R. (2020). Implementasi karakter peduli lingkungan sungai berbasis kewarganegaraan ekologis melalui program adiwiyata di sekolah dasar. *Jurnal Moral Kemasyarakatan*, 5(2), 68–74. <https://doi.org/10.21067/jmk.v5i2.5069>
- Gugssa, M. A. (2023). Characterizing environmental education practices in Ethiopian primary schools. *International Journal of Educational Development*, 102, 102848. <https://doi.org/10.1016/j.ijedudev.2023.102848>
- Halimah, L., & Anisah, A. (2018). Internalisasi nilai pendidikan kewarganegaraan pada tradisi pesta laut blanakan dalam rangka pengembangan ideal democratic citizen. *Jurnal Civics: Media Kajian Kewarganegaraan*, 15(2), 148–160. <https://doi.org/10.21831/jc.v15i2.21641>
- Halimah, L., & Nurul, S. F. (2020). Refleksi terhadap kewarganegaraan ekologis dan tanggung jawab warga negara melalui program ecovillage. *Jurnal Civics: Media Kajian Kewarganegaraan*, 17(2), 142–152. <https://doi.org/10.21831/jc.v17i2.28465>
- Japar, M., & Fadhillah, D. N. (2018). The development of intellectual culture through character education learning in higher education. *Proceeding International Conference on University and Intellectual Culture*, 1(1), 22–34.
- Jumirah, J., Sari, P. A., Kusnadi, E., & Oktaviani, A. D. (2021). Analisis kesadaran lingkungan siswa sekolah pada kegiatan green-chemistry dalam kondisi new normal pandemi Covid-19. *DIKSAINS: Jurnal Ilmiah Pendidikan Sains*, 2(1), 31–36. <https://doi.org/10.33369/diksains.2.1.31-36>
- Kabunggul, J., Pramita, D., Mandailina, V., Abdillah, A., Mahsup, M., & Sirajuddin, S. (2020). Meningkatkan motivasi dan hasil belajar siswa melalui penerapan model pembelajaran team game tournament berbantuan media android. *Pendekar: Jurnal Pendidikan Berkarakter*, 3(2), 1–4. <https://journal.ummat.ac.id/index.php/pendekar/article/view/2804>
- Kang, J., & Hong, J. H. (2021). Framing effect of environmental cost information on environmental awareness among high school students. *Environmental Education Research*, 27(6), 936–953. <https://doi.org/10.1080/13504622.2021.1928607>
- Lickona, T. (1999). Character education: Seven crucial issues. *Action in Teacher Education*, 20(4), 77–84. <https://doi.org/10.1080/01626620.1999.10462937>
- Mazloumiyan, S., Shobeiri, S. M., Farajollahi, M., & Mohamadi, M. (2012). Blended e-learning: a new approach to environmental education of Iran high schools. *Procedia - Social and Behavioral Sciences*, 47, 1216–1220. <https://doi.org/10.1016/j.sbspro.2012.06.803>
- Miles, M. B., Huberman, A. M., & Saldana, J. (2018). *Qualitative data analysis: A methods sourcebook*. SAGE Publications.
- Mulyono, B. (2017). Reorientasi civic disposition dalam kurikulum Pendidikan Kewarganegaraan sebagai upaya membentuk warga negara yang ideal. *Jurnal Civics: Media Kajian Kewarganegaraan*, 14(2), 218–225. <https://doi.org/10.21831/civics.v14i2.17007>
- Pelita, A. C., & Widodo, H. (2020). Evaluasi program sekolah Adiwiyata di Sekolah Dasar Muhammadiyah Bantul Kota. *Sekolah Dasar: Kajian Teori Dan Praktik Pendidikan*, 29(2), 145–157. <https://doi.org/10.17977/um009v29i22020p145>
- Piras, S., Righi, S., Banchelli, F., Giordano, C., & Setti, M. (2023). Food waste between environmental education, peers, and family influence. Insights from primary school students in Northern Italy. *Journal of Cleaner Production*, 383, 135461. <https://doi.org/10.1016/j.jclepro.2022.135461>
- Saldaña, J. (2013). *The coding manual for qualitative researchers*. Springer.



- Setianingsih, S. (2023). Menumbuhkan kepekaan lingkungan siswa melalui pembelajaran sejarah terkait dampak eksploitasi alam masa revolusi industri. *ARZUSIN*, 3(1), 39–46. <https://doi.org/10.58578/arzusin.v3i1.827>
- Srbinovski, M., Ismaili, M., & Zenki, V. (2014). Didactic Preconditions for Environmental Education in the Macedonian Secondary Schools. *Procedia - Social and Behavioral Sciences*, 116, 88–94. <https://doi.org/10.1016/j.sbspro.2014.01.173>
- Tikho, A. E., & Gunansyah, G. (2021). Studi analisis: Implementasi program adiwiyata di sekolah dasar. *Jpgsd*, 9(09), 3384–3398. <https://ejournal.unesa.ac.id/index.php/jurnal-penelitian-pgsd/article/view/43500>
- van de Wetering, J., Leijten, P., Spitzer, J., & Thomaes, S. (2022). Does environmental education benefit environmental outcomes in children and adolescents? A meta-analysis. *Journal of Environmental Psychology*, 81, 101782. <https://doi.org/10.1016/j.jenvp.2022.101782>
- Voulvoulis, N., & Burgman, M. A. (2019). The contrasting roles of science and technology in environmental challenges. *Critical Reviews in Environmental Science and Technology*, 49(12), 1079–1106. <https://doi.org/10.1080/10643389.2019.1565519>
- Wahidin, S. (1919). *Dimensi hukum perlindungan dan pengelolaan Llingkungan hidup*.
- Wardani, D. N. K. (2020). Analisis implementasi program Adiwiyata dalam membangun karakter peduli lingkungan. *Southeast Asian Journal of Islamic Education Management*, 1(1), 60–73. <https://doi.org/10.21154/sajiem.v1i1.6>
- Yuan, M., Yang, Y., & Yi, H. (2023). Environmental condition, cultural worldview, and environmental perceptions in China. *Journal of Risk Research*, 26(7), 748–777. <https://doi.org/10.1080/13669877.2023.2208134>
- Zhu, M. (2023). The role of human capital and environmental protection on the sustainable development goals: new evidences from Chinese economy. *Economic Research-Ekonomska Istraživanja*, 36(1), 650–667. <https://doi.org/10.1080/1331677X.2022.2113334>
- Zikargae, M. H., Woldearegay, A. G., & Skjerdal, T. (2022). Empowering rural society through non-formal environmental education: An empirical study of environment and forest development community projects in Ethiopia. *Heliyon*, 8(3), e09127. <https://doi.org/10.1016/j.heliyon.2022.e09127>