

# The Effect of Adiwiyata School Program Implementation on the Ability of Environmental Literacy of Students

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**Abstract:** Environmental problems are currently the center of world attention, especially environmental degradation in Indonesia. Education is one of the efforts to improve environmental literacy by implementing the Adiwiyata School program. This research aims to 1) analyze the conditions of the implementation of the Adiwiyata School program at Public Senior High School 3 Surakarta; 2) analyze the environmental literacy ability of students in Public Senior High School 3 Surakarta; and 3) know the effect of the implementation of adiwiyata school program on the literacy ability of students in Public Senior High School 3 Surakarta. This type of research is quantitative and has a correlation research design. The sample in this study amounted to 45 teachers and 100 students at Public Senior High School 3 Surakarta. Data collection techniques and instruments used include test sheets, questionnaires, and documentation. Data analysis techniques used descriptive statistics and independent t-tests. The results showed that 1) the implementation conditions of the Adiwiyata School program at Public Senior High School 3 Surakarta obtained excellent results with the percentage of each indicator consisting of an environmentally sound policy of 63%, the implementation of an environmentally-based curriculum 58%, and environmentally friendly support facilities management 75%, while

participatory-based environmental activities obtained good results with a percentage of 49%; 2) the ability of environmental literacy of students in Public Senior High School 3 Surakarta obtained knowledge results 74%, attitude 71%, and behaviour 74% so classified in good criteria, while cognitive ability 42% so classified in moderate criteria; and 3) obtained the value of the significance of sig p-value (2-tailed)  $0.000 \leq 0.05$   $H_0$  were rejected and  $H_1$  was accepted, so there was an influence between the Adiwiyata School program implementation on the students literacy capabilities in Public Senior High School 3 Surakarta.

**Keywords:** Adiwiyata School Program, Environmental Education, Environmental Issues, Environmental Literacy

## Introduction

Environmental problems are currently the center of world attention, especially ecological degradation in Indonesia. Forest and land fires reached 857,756 hectares in 2019 (630,451 hectares of mineral land and 227,304 hectares of peatland); the figure continues to increase by 160% compared to the case in 2018, which experienced fires covering an area of 328,724 hectares (Nugraha, 2019). The environmental degradation event experienced by Indonesia resulted in continued impacts in the form of disasters, such as haze, floods,

landslides, and others. Environmental degradation that causes further disasters results from human activities that damage environmental ecosystems (Kamil et al., 2020; Zhou et al., 2020; Marfai, 2019). One indicator that can determine the quality of the environment is human behaviour.

Irresponsible human behaviour towards environmental ecosystems causes various environmental damage. (Hadiyati & Cindo, 2021; Tcyplakova et al., 2021; Sumarmi, 2016). Fitria & Indra (2020) and Bissinger & Bogner (2018) Human behaviour that is not responsible for the environment reflects low environmental literacy. Environmental literacy is the ability to understand, maintain, and solve environmental problems properly and correctly. (Afrianda et al., 2019; Goulgouti et al., 2019; Haske & Wulan, 2015). Environmental literacy can be measured through four indicators: knowledge, cognitive skills, attitudes, and behaviour (McBeth & Volk, 2009). A person has good environmental literacy to know what is done for the environment (Maurer & Bogner, 2020; Veisi et al., 2019; Hollweg et al., 2011). This ability also applies to students.

Environmental literacy skills can encourage students to be sensitive to environmental problems. (Rafidah & Rachmadiarti, 2022; Ramadhan et al., 2019; Febriasari & Supriatna, 2017), so that environmental literacy can foster character caring about the environment. Braun et al. (2018) and Nofiana & Julianto (2018), The ability of environmental literacy of students is still relatively low; only 29.3% of students have met the assessment of environmental literacy, while as many as 70.7% still do not meet the assessment (Igbokwe, 2016). Efforts must be made to improve the ability of students with environmental literacy.

Improvement efforts to educate human awareness about environmental literacy through the education sector because education is an institution that is considered effective in providing knowledge competencies (Pahleviannur & Hafida, 2022; Mudrikah et al., 2021; Kamil et al., 2019). Education is one of the efforts that can be done in environmental education. Education is the most critical factor in efforts to improve environmental literacy. The higher the literacy of the environment, the more awareness will grow in maintaining the environment. (Prastiwi et al., 2020; Kurnianto et al., 2018; Iswari & Utomo, 2017). One solution to improving environmental literacy is to implement the Adiwiyata School program.

Adiwiyata School Program is a program that aims to encourage the creation of schools, and the entire school community has an attitude of caring for the environment, especially students as future generations. Adiwiyata School Program is the school's commitment to educating students to care about the environment (N Nurwidodo et al., 2020; Siswanto et al., 2019; Rakhmawati et al., 2016). One of the programs found in Adiwiyata School is the integration of Environmental Education into the curriculum structure (Indahri, 2020; Istiqomah, 2019; Saddhono et al., 2019). There are five objectives of integrating

environmental education into the curriculum structure of Adiwiyata School: building awareness, increasing knowledge, forming attitudes, increasing participation, and evaluating the surrounding environment (Adisendjaja & Romlah, 2008). Learning environmental education at Adiwiyata School is expected to increase students' knowledge, behaviour, and concern of students to able to maintain environmental sustainability (Fajar & Putra, 2021; Sigit et al., 2021; Susilawati et al., 2020). One school that has implemented and received awards as a National Adiwiyata School is Public Senior High School 3 Surakarta.

Public Senior High School 3 Surakarta was awarded as a National Adiwiyata School in 2020 by the Ministry of Environment. The problem is that the attitude of caring about the environment of students in Public Senior High School 3 Surakarta is relatively moderate, even though it has implemented the Adiwiyata School program. (Prabumukti & Widiyatmoko, 2021). So, research is needed to determine the effect of implementing the Adiwiyata School program on students' environmental literacy. It is expected that the implementation of the Adiwiyata School program can improve students' environmental literacy. Therefore, this research aims to 1) analyze the conditions of the implementation of the Adiwiyata School program at Public Senior High School 3 Surakarta; 2) analyze the environmental literacy ability of students in Public Senior High School 3 Surakarta; and 3) know the effect of the implementation of adiwiyata school program on the literacy ability of students in Public Senior High School 3 Surakarta.

## Methodology

The place used as a location for data collection is Public Senior High School 3 Surakarta because it is a school that received an award as a National Level Adiwiyata School in 2020 from the Ministry of Environment. The type of research used by researchers is the quantitative type. Data processed using quantitative research types in this study is data recapitulation of teacher answers to essential components in the Adiwiyata school implementation guidelines and data recapitulation of students' answers to environmental literacy indicators. This research uses a correlation research design to determine the influence of adiwiyata school implementation on students' environmental literacy.

The population contained in this study are teachers at Public Senior High School 3 Surakarta, with 71 teachers and students in 1175 students. In determining the sample, the researchers used the formula slovin. Researchers used the Slovin formula because the population number is already known. The sampling technique used by researchers is simple random sampling. The sample contained in this study was 45 teachers and 100 students at Public Senior High School 3 Surakarta. The variables contained in this study consist of two variables, namely dependent and independent variables. The dependent variable included in this study is the condition of implementing the Adiwiyata School program. The indicators

included in the variable conditions of implementation of the Adiwiyata School program are as follows:

**Table 1.** Variable Indicators of Adiwiyata School Program Implementation Conditions

Indicators		Sub-Indicators
Environmentally Sound Policy		The curriculum contains policies for environmental protection and management efforts.
		School activity plans and budgets contain programs to protect and manage the environment.
Implementation of Environmentally Based-Curriculum		Teachers are competent in developing environmental learning activities.
		Students conduct learning activities about environmental protection and management.
Participatory Based-Environmental Activities		Carrying out planned environmental protection and management activities for school residents
		Establish partnerships in environmental protection and management framework with various parties (community, government, media, and other schools)
Environmentally Friendly Support Facilities Manager		Availability of environmentally friendly supporting infrastructure facilities
		Improving the quality of management and utilization of environmentally friendly facilities and infrastructure

Source: Indonesian Ministry of Environment and Forestry & Indonesian Ministry of Education and Culture (2012)

This study's independent variable is environmental literacy learners' ability. The indicators included in the variables of the learning environment literacy ability are as follows:

**Table 2.** Variable Indicators of Students' Environmental Literacy Ability

Indicators	Sub-Indicators
Knowledge	Ecological knowledge
	Identify environmental issues
Cognitive Ability	Analysis of environmental issues
	Problem-solving planning
Attitude	Verbal commitment
	Environmental sensitivity
Behaviour	Actual commitment

Source: McBeth & Volk (2009)

Researchers used techniques and data collection instruments, such as test sheets, questionnaires, and documentation. They collected and obtained the data using Google Forms to minimize direct contact with students and teachers and create mutual security. The data collection instruments were disseminated by sharing links with the assistance of teachers.

The test sheet used by the researchers in this study uses multiple-choice questions with five alternative answers and is adapted from the Middle School Environmental Literacy Survey (MSELS) instrument so that the test sheet has been tested for validity and reliability.

The test sheet in this study aims to determine students' environmental literacy in Adiwiyata School based on indicators of knowledge and cognitive abilities related to the environment. The questionnaires in this study used a closed questionnaire, so questionnaire answers were already available. The questionnaires used by the researchers in the study contained two types: the first questionnaire for teachers and the second for students.

The questionnaire for teachers uses the Likert scale, which uses five alternative answers and is adapted from the Ministry of Environment's Adiwiyata Guidebook of Cooperation with the Ministry of Education and Culture. The teacher questionnaire aims to determine the conditions of implementing the Adiwiyata School program at Public Senior High School 3 Surakarta. Questionnaires for students use the Likert scale, which uses five alternative answers and is adapted from the Middle School Environmental Literacy Survey (MSELS) instrument. The questionnaire aims to determine the environmental literacy skills of students in Adiwiyata School on indicators of attitudes and behaviour towards the environment. Both questionnaires adapted from the Adiwiyata Handbook and the Middle School Environmental Literacy Survey (MSELS) have been tested, so the questionnaires in this study have been valid and reliable for research use. The documentation contained in this study is in documents and photos of school conditions.

The hypothesis contained in this study is as follows:

H0: There is no influence between implementing the Adiwiyata school program and environmental literacy students' ability.

H1: There is an influence between implementing the Adiwiyata School program and the students' environmental literacy ability.

Data analysis techniques were used to determine the conditions for implementing the Adiwiyata School program at Public Senior High School 3 Surakarta, and students' environmental literacy ability was assessed using descriptive statistical analysis. Data was processed with descriptive statistics as data recapitulation of teacher answers to essential components in the Adiwiyata school implementation guidelines and students' answers to environmental literacy indicators. The research data was analyzed using descriptive statistics and adjusted to environmental literacy criteria. The research data has been analyzed using descriptive statistics and then adjusted to environmental literacy criteria. The environmental literacy formula is as follows:

**Table 3.** Criteria for Environmental Literacy Skills of Students

Percentage (%)	Criteria
86 – 100	Very Good
61 – 80	Good
41 – 60	Moderate
21 – 40	Not Good
≤ 20	Not Very Good

The effect of the Adiwiyata School program on students' environmental literacy is analyzed with an independent sample t-test. A prerequisite test is required to conduct an independent sample t-test for research data. The prerequisite tests contained in this study use tests of normality, linearity, and homogeneity. The results showed that the data was expected, linear, and homogeneous so that the data could be used as a result of the study. The calculation of the independent sample t-test in this study was assisted by SPSS software. The basis of decision-making is as follows:

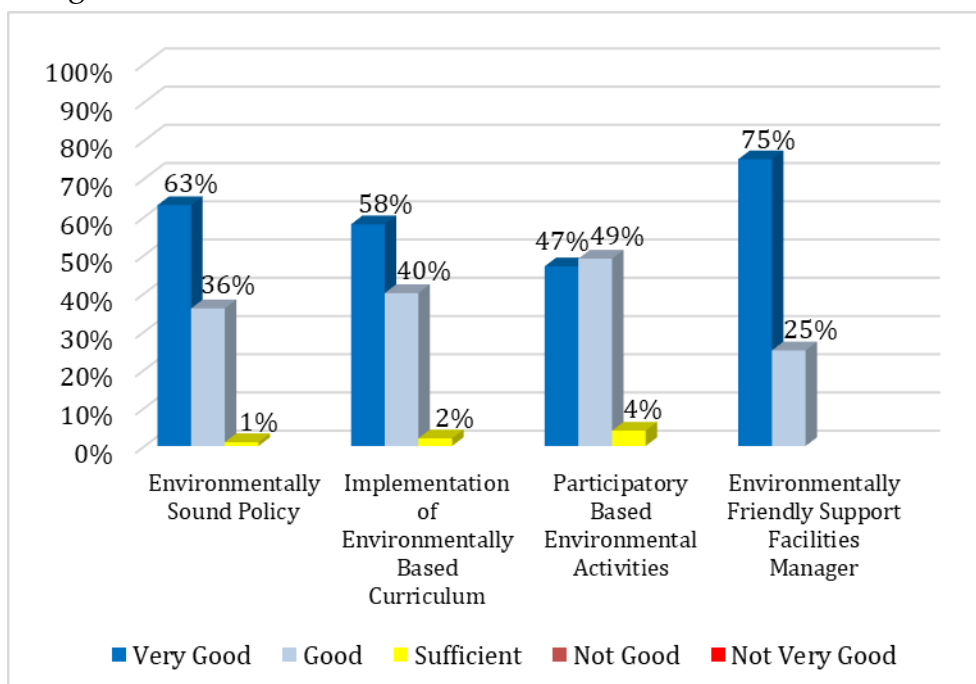
H0 accepted and H1 rejected =  $p\text{-value} > 0.05$

H0 rejected and H1 accepted =  $p\text{-value} < 0.05$

## Result and Discussion

### A. Conditions of Implementation of Adiwiyata School Program at Public Senior High School 3 Surakarta

The implementation conditions of the Adiwiyata School program consist of four indicators: environmentally sound policies, implementation of environmental-based curriculum, participatory-based environmental activities, and environmentally friendly support facilities management. The research results on the variable conditions of implementing the Adiwiyata School program at Public Senior High School 3 Surakarta are presented in Figure 1.



**Figure 1.** The Results of Conditions Implementation of the Adiwiyata School Program at Public Senior High School 3 Surakarta



Based on Figure 1, the results showed that the conditions at Public Senior High School 3 Surakarta were declared very good in the first indicator regarding environmentally sound policies. The most significant percentage was 63% with perfect criteria, 36% good, and 1% sufficient. The conditions at Public Senior High School 3 Surakarta were declared very good in the second indicator regarding implementing the environmental-based curriculum. The most significant percentage was 58% with perfect criteria, 40% good, and 2% sufficient. Public Senior High School 3 Surakarta conditions were declared good in the third indicator regarding participatory-based environmental activities. The most significant percentage was 49% with reasonable criteria, 47% was perfect, and 4% was sufficient. In the fourth indicator regarding the management of environmentally friendly supporting facilities, Public Senior High School 3 Surakarta conditions were declared very good. The most significant percentage was 75% with perfect criteria and 25% good.

### 1. Environmentally Sound Policy

Environmentally sound policy is an indicator of the Adiwiyata school program consisting of two sub-indicators, namely the integration of an environmental-based curriculum and activity plan to the budget that aims as one of the efforts in environmental protection and management in schools. Public Senior High School 3 Surakarta has implemented an environmental-based curriculum to create a syllabus, Learning Implementation Plan (RPP), environmental materials, socialization of environmental education, creation of mission vision, and environmentally minded school goals. The integration of the environmental-based curriculum at Public Senior High School 3 Surakarta related to the mission, vision, and objectives of environmentally-minded schools is presented in Figure 2.



**Figure 2.** The Mision Vision and Objectives of Environmentally-minded at Public Senior High School 3 Surakarta

Based on Figure 2, Public Senior High School 3 Surakarta has implemented an environmentally-minded school's mission, vision, and objectives. Implementation of the mission, vision, and goals of environmentally-minded schools at Public Senior High School 3 Surakarta can be outlined as follows:

a) Vision

"To be an environmentally minded school".

b) Mission

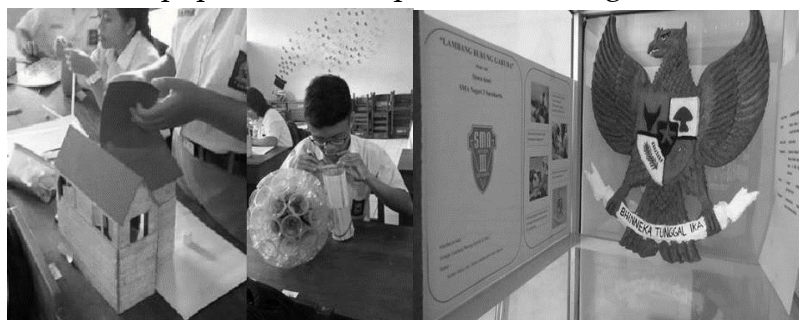
"Organizing activities that foster caring attitudes towards the environment and provide provisions about the preservation, prevention, pollution, and repair of environmental damage."

c) The goal is

"To develop an attitude of caring for the environment and realizing a comfortable and environmentally friendly school."

This follows research conducted by Manobe et al. (2021), which showed that the school's mission, vision, and objectives may support environmentally sound policies. However, socialization needs to be done about the vision of the school's mission and goals with an environmental outlook so that the school's program can run well and be understood by all school residents.

Public Senior High School 3 Surakarta related to planning activities and budgets related to the environment is carried out using water and electricity use efficiency, making activity planning, and budget making in the development of environmental education. Public Senior High School 3 Surakarta has budgeted to develop and support the Adiwiyata School program by about 20%. The budget of Public Senior High School 3 Surakarta for activities in developing and supporting the Adiwiyata School program is not too large because it does not require much cost, and activities carried out can utilize used materials in the surrounding environment. Activities at Public Senior High School 3 Surakarta in utilizing plastic, wood, and paper waste are presented in Figure 3.



**Figure 3.** Craft Utilizes Environmental Waste



Based on Figure 3, Public Senior High School 3 Surakarta students make crafts derived from environmental waste. The craft utilizes environmental waste, such as plastic, wood, and paper. This is following research conducted by Rijanta et al. (2018), that good natural resources can be utilized by doing works that function in environmental management, thereby reducing the decline in the quality of the environment by reusing used materials.

## 2. Implementation of Environmentally Based Curriculum

Implementing the environment-based curriculum is an indicator of the Adiwiyata School program, which consists of sub-indicators, namely the competence of teachers in developing environmental learning activities and student activities in learning about environmental protection and management. Teachers at Public Senior High School 3 Surakarta in learning provide examples of local and global issues related to environmental education. This is following Yuliana (2021) Research shows that teachers learning at Adiwiyata School develop local and global environmental protection and management issues, as shown in the learning materials. Public Senior High School 3 Surakarta students actively support environmentally caring cultural behaviour such as biopori manufacturing. Student activities at Public Senior High School 3 Surakarta in manufacturing biopori are presented in Figure 4.



**Figure 4.** Biopori Manufacturing Activities

Based on Figure 4, Public Senior High School 3 Surakarta students conducted biopori manufacturing activities. They are implementing biopori manufacturing in Public Senior High School 3 Surakarta by forming a working group. The activity aims to be a form of effort to protect and manage the school environment. This is following the research conducted by Ramadhani et al. (2021) One of the implementations of the Adiwiyata School program is making biopori by forming a working group.

## 3. Participatory-Based Environmental Activities

Participatory-based environmental activities are indicators of the Adiwiyata School program consisting of two sub-indicators, namely implementing environmental management activities initiated by the school and establishing partnerships with various

parties. Public Senior High School 3 Surakarta involves the surrounding community to care about the environment. This is following research conducted by Koesnawan (2021); adiwiyata School needs to involve the surrounding community in carrying out various activities related to the environment.

Public Senior High School 3 Surakarta is actively establishing partnerships with the Surakarta City Environment Office by frequently holding visits and the department to the school. In addition, Public Senior High School 3 Surakarta also got the mandate to have a built school or partner school to be developed towards Adiwiyata School. This is following research conducted by Sumiati (2021) The school that has become Adiwiyata needs to establish a partnership relationship to hold a Memorandum of Understanding (MoU) with educational institutions, agricultural services, health services, and the environment. In addition, the school also establishes a relationship with the built school.

#### 4. Environmentally Friendly Support Facilities Manager

The manager of environmentally friendly supporting facilities is an indicator of the Adiwiyata School program, which consists of two sub-indicators, namely the availability of environmentally friendly supporting infrastructure facilities and the improvement of the quality of the utilization of environmentally friendly facilities and infrastructure. Public Senior High School 3 Surakarta has five types of trash cans. Five types of trash cans in Public Senior High School 3 Surakarta are presented in Figure 5.



**Figure 5.** Five Types of Trash Cans in Public Senior High School 3 Surakarta

Based on Figure 5, environmentally sound infrastructure facilities are available at Public Senior High School 3 Surakarta, which has five types of garbage cans: organic, non-organic, hazardous, and toxic materials, paper recycling, and residues. This follows the research conducted by Amaliyah et al. (2021), which supports environmentally sound infrastructure facilities by procuring trash cans of their type. However, school residents still need socialization related to the kinds of garbage to be optimal in maintaining the

environment. The management and utilization of environmentally friendly facilities and infrastructure in Public Senior High School 3 Surakarta can be done by making compost. The manufacture of compost fertilizer in Public Senior High School 3 Surakarta is presented in Figure 6.

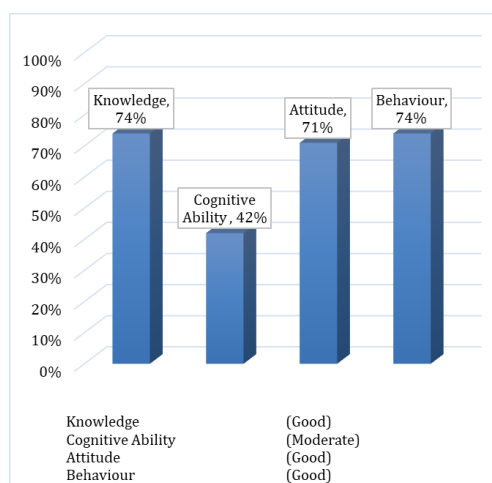


**Figure 6.** Manufacture of Compost Fertilizer in Public Senior High School 3 Surakarta

Based on Figure 6, Public Senior High School 3 Surakarta manages and utilizes environmentally friendly infrastructure facilities by making compost fertilizer. In addition to managing the environment, compost fertilizers can train students to be aware of the environment. This is following research conducted by Meilani & Rasman (2021), that the manufacture of compost fertilizer in schools is part of the Adiwiyata School program, which aims to foster students' awareness of waste management. In addition, finished compost fertilizer can be reused to increase soil fertility in school gardens.

### B. Environmental Literacy Skills of Public Senior High School Students 3 Surakarta

The literacy ability of the student's environment consists of four indicators: knowledge, ability, attitude, and behaviour. Figure 7 presents the research results on the variables of the environmental literacy ability of students at Public Senior High School 3 Surakarta.



**Figure 7.** The Results of Environmental Literacy Skills of Public Senior High School 3 Surakarta

Based on Figure 7, the study results showed that in the first indicator, students' knowledge of the environment was grouped in good criteria because it obtained a percentage of 74%. In the second indicator, students' cognitive ability to the environment is grouped in moderate criteria because it obtains a percentage of 42%. In the third indicator, students' attitudes towards the environment are grouped in good criteria, as they gain 71%. In the fourth indicator, students' behaviour towards the environment is grouped in good criteria because it obtains a percentage of 74%.

#### 1) Knowledge

Ecological knowledge aims to know environmental literacy related to the relationship of living things with others and their environment. Students' knowledge at Public Senior High School 3 Surakarta is good, as evidenced in Figure 8. The study results obtained a percentage of 74% with Good criteria. This is different from the research conducted by Santoso et al. (2021), in that the ecological knowledge of students obtains low results. According to Ozsoy et al. (2012), the low literacy ability of the student's environment is due to the lack of a direct learning experience to interact with the surrounding environment.

#### 2) Cognitive Ability

Cognitive ability aims to know environmental literacy related to actions and problem-solving to issues that occur in the environment. Students' cognitive abilities at Public Senior High School 3 Surakarta are evidenced in Figure 8. The study results obtained a percentage of 42% with moderate criteria and are the lowest indicator of all indicators of environmental literacy. This is following research conducted by Safitri et al. (2020), that students' cognitive ability has the lowest percentage of all indicators, which is 36.7%, and is in the category of less good. According to Rokhmah & Fauziah (2021), poor cognitive ability due to learning in school only conveys related environmental information. Hence, students' knowledge is good, but they have not been trained in applying and solving environmental problems.

#### 3) Attitude

Attitudes aim to know environmental literacy related to opinions, beliefs, and feelings to respond to environmental sensitivity. Students' attitudes in Public Senior High School 3 Surakarta are good, as evidenced in Figure 8. The study results obtained a percentage of 71% with Good criteria. This is following research conducted by Rokhmah & Fauziah (2021), that students' attitude towards the environment is in a good category with a percentage of 79.5%. According to Pratama et al. (2020) The attitude of caring about the environment of students can be formed through environmental management activities in schools. Attitudes to caring for the environment of students can grow with habituation. (Safitri et al., 2020).

#### 4) Behaviour

Behaviour aims to find out environmental literacy related to addressing actual environmental problems. Students' behaviour in Public Senior High School 3 Surakarta is

good, as evidenced in Figure 8. The study results obtained a percentage of 74% with good criteria. This is different from the research conducted by Nurwidodo et al. (2021), in that students' behaviour towards the environment is less, with a percentage of 53.88%. According to Munawar et al. (2019), knowledge can affect students' behaviour towards the environment. Good knowledge can foster environmentally conscious behaviour to preserve the environment. Behaviour-based knowledge can last a long time when maintaining and managing the environment. (Martini, 2019).

### C. The Effect of Adiwiyata School Program Implementation on Environmental Literacy of Students at Public Senior High School 3 Surakarta

The data obtained from the study results met the prerequisite tests (normality, linearity, and homogeneity tests). Data that has qualified on the prerequisite test can be continued with an independent sample t-test. The independent sample t-test in this study is presented in Table 4.

**Table 4.** The Results of the Effect of Adiwiyata School Program Implementation on Environmental Literacy of Students at Public Senior High School 3 Surakarta Independent Samples Test

	t-test for Equality of Means			
	t	df	Sig. (2-tailed)	Upper
Equal variances assumed	9.515	40	.000	1.19681
Equal variances not assumed	9.515	39.826	.000	1.19684

Based on Table 4, the sig p-value significance value is obtained. (2-tailed) 0.000. The results showed that  $0.000 \leq 0.05$   $H_0$  were rejected and  $H_1$  accepted. This means there is an influence between implementing the Adiwiyata School program and the environmental literacy ability of students at Public Senior High School 3 Surakarta. Adiwiyata School Program at Public Senior High School 3 Surakarta has been outstanding in every indicator implemented, so the Adiwiyata School program in Public Senior High School 3 Surakarta can foster the literacy skills of students environment.

Public Senior High School 3 Surakarta has implemented the Adiwiyata school program indicators. The programs and activities of Public Senior High School 3 Surakarta that have been following Adiwiyata school indicators include the vision of an environmentally sound mission, environmentally sound school objectives, budget to support Adiwiyata activities, the establishment of working groups, slogans about the environment, separation of five types of garbage cans, biopori, compost making, healthy canteens, and partnerships with related agencies. So, the Adiwiyata School program



implementation can affect the ability of environmental literacy of students in Public Senior High School 3 Surakarta.

This is following research conducted by Afrianda et al. (2019), that adiwiyata school programs influence students' environmental literacy. Adiwiyata School Program influences students' environmental literacy because the school has implemented adiwiyata school program indicators in various activities: waste management, healthy canteens, green parks, live pharmacies, nurseries, biopori, learning innovation, and environmental-based curriculum. Good programs and activities in schools can foster the attitude of caring for the environment of students, thus affecting environmental literacy. However, the results of the study are different from the research conducted by Pratama et al. (2020), that there is no influence between the Adiwiyata School program and students' attitudes toward caring for their environment.

## Conclusion

The implementation conditions of the Adiwiyata School program at Public Senior High School 3 Surakarta obtained excellent results, with the percentage of each indicator consisting of an environmentally sound policy at 63%, the implementation of an environmentally-based curriculum at 58%, and environmentally friendly supporting facilities at management 75%, in comparison participatory-based environmental activities obtained good results with 49%. The environmental literacy ability of students at Public Senior High School 3 Surakarta obtained knowledge results of 74%, attitude 71%, and behaviour 74%, which is classified in good criteria. In comparison, cognitive 42% is classified in moderate criteria. The influence of implementing the Adiwiyata School program on the environmental literacy ability of students at Public Senior High School 3 Surakarta obtained the results of sig p-value significance. (2-tailed)  $0,000 \leq 0,05$   $H_0$  were rejected, and  $H_1$  was accepted, so there was an influence between the implementation of the Adiwiyata School program and the environmental literacy ability of students at Public Senior High School 3 Surakarta.

## References

- Afrianda, R., Yolida, B., & Marpaung, R. R. T. (2019). Pengaruh Program Adiwiyata terhadap Literasi Lingkungan dan Sikap Peduli Lingkungan. *Jurnal Bioterdidik: Wahana Ekspresi Ilmiah*, 7(1), 32–42.
- Amaliyah, F., Sudarti, S., & Subchan, W. (2021). Analisis Perilaku Etika Lingkungan Hidup Siswa SMAN di Jember. *Jurnal Pendidikan MIPA*, 11(2), 113–120.
- Bissinger, K., & Bogner, F. X. (2018). Environmental Literacy in Practice: Education on Tropical Rainforests and Climate Change. *Environment, Development and Sustainability*, 20(5), 2079–2094.



- Braun, T., Cottrell, R., & Dierkes, P. (2018). Fostering Changes in Attitude, Knowledge and Behavior: Demographic Variation in Environmental Education Effects. *Environmental Education Research*, 24(6), 899–920.
- Fajar, W. M., & Putra, E. D. (2021). Peran Guru melalui Program Adiwiyata dalam Mengembangkan Karakter Peduli Lingkungan. *MIMBAR PGSD Undiksha*, 9(3).
- Febriasari, L. K., & Supriatna, N. (2017). Enhance Environmental Literacy through Problem Based Learning. *Journal of Physics: Conference Series*, 895(1), 12163.
- Fitria, Y., & Indra, W. (2020). *Pengembangan Model Pembelajaran PBL Berbasis Digital untuk Meningkatkan Karakter Peduli Lingkungan dan Literasi Sains*. Deepublish.
- Goulgouti, A., Plakitsi, A., & Stylos, G. (2019). Environmental Literacy: Evaluating Knowledge, Affect, and Behavior of Pre-Service Teachers in Greece. *Interdisciplinary Journal of Environmental and Science Education*, 15(1), e02202.
- Hadiyati, N., & Cindo, C. (2021). Kontekstualisasi Pencemaran Ekosistem Laut dalam Mencapai SDGs: Suatu Kajian Hukum Lingkungan di Indonesia. *NUSANTARA: Jurnal Ilmu Pengetahuan Sosial*, 8(3), 300–313.
- Haske, A. S., & Wulan, A. R. (2015). Pengembangan E-learning berbasis MOODLE dalam Pembelajaran Ekosistem untuk Meningkatkan Literasi Lingkungan Siswa pada Program Pengayaan. *Seminar Nasional XII Pendidikan Biologi FKIP UNS*, 403.
- Hollweg, K. S., Taylor, J. R., Bybee, R. W., Marcinkowski, T. J., McBeth, W. C., & Zoido, P. (2011). Assessing Environmental Literacy: A Proposed Framework for the Programme for International Student Assessment (PISA) 2015. In *Retrieved for North American Association for Environmental Education*.
- Igbokwe, B. (2016). *Environmental Literacy Assessment: Assessing the Strength of an Environmental Education Program (EcoSchools) in Ontario Secondary Schools for Environmental Literacy Acquisition*. University of Windsor (Canada).
- Indahri, Y. (2020). Pengembangan Pendidikan Lingkungan Hidup melalui Program Adiwiyata (Studi di Kota Surabaya). *Aspirasi: Jurnal Masalah-Masalah Sosial I*, 11(2), 121–134.
- Istiqomah, I. (2019). Sikap Peduli Lingkungan Peserta Didik di MAN-1 Pekanbaru sebagai Sekolah Adiwiyata. *Dinamika Lingkungan Indonesia*, 6(2), 95–103.
- Iswari, R. D., & Utomo, S. W. (2017). Evaluasi Penerapan Program Adiwiyata untuk membentuk Perilaku Peduli Lingkungan di kalangan Siswa (Kasus: SMA Negeri 9 Tangerang Selatan dan MA Negeri 1 Serpong). *Jurnal Ilmu Lingkungan*, 15(1), 35–41.
- Kamil, P. A., Putri, E., & Ridha, S. (2019). Optimalisasi Environmental Literacy Pada Sekolah Adiwiyata di Kota Banda Aceh Untuk Menanamkan Sikap Peduli Lingkungan. *Jurnal Georafflesia: Artikel Ilmiah Pendidikan Geografi*, 4, 127–138.
- Kamil, P. A., Utaya, S., & Utomo, D. H. (2020). Improving Disaster Knowledge within High School Students through Geographic Literacy. *International Journal of Disaster Risk Reduction*, 43, 101411.
- Koesnawan, F. N. (2021). Pelaksanaan dan Aplikasi Sekolah Berbasis Wawasan Lingkungan melalui Program Sekolah Adiwiyata Nasional pada Sekolah Swasta dan Negeri. *SINTAKSIS: Jurnal Ilmiah Pendidikan*, 3(1), 61–68.

- Kurnianto, F. A., Ikhsan, F. A., Nurdin, E. A., Apriyanto, B., & Liou, Y. A. (2018). The Influence of Group Investigation Learning Model on College Students Learning Motivation Towards Environment Education. *Geosfera Indonesia*, 2(1), 1–10.
- Manobe, J. M., Arjana, I. G. B., & Se, R. (2021). Implementasi Kebijakan Adiwiyata dalam Pengelolaan Lingkungan Sekolah Menengah Atas Negeri 4 Kupang. *Syntax Idea*, 3(3), 546–566.
- Marfai, M. A. (2019). *Pengantar Etika Lingkungan dan Kearifan Lokal*. UGM PRESS.
- Martini, M. (2019). Hubungan antara Pengetahuan Lingkungan dengan Perilaku Prolingkungan Sekolah Adiwiyata (Studi Kasus Sdn 21 Taluak Kab. Agam). *Rang Teknik Journal*, 2(1).
- Maurer, M., & Bogner, F. X. (2020). Modelling Environmental Literacy with Environmental Knowledge, Values and (Reported) Behaviour. *Studies in Educational Evaluation*, 65, 100863.
- McBeth, W., & Volk, T. L. (2009). The National Environmental Literacy Project: A Baseline Study of Middle Grade Students in the United States. *The Journal of Environmental Education*, 41(1), 55–67.
- Meilani, S. S., & Rasman, M. (2021). Pengomposan Sampah Organik sebagai upaya Pengelolaan Lingkungan di Sekolah Dasar. *JATI EMAS (Jurnal Aplikasi Teknik Dan Pengabdian Masyarakat)*, 5(3), 75–78.
- Mudrikah, S., Pahleviannur, M. R., Surur, M., Rahmah, N., Siahaan, M. N., Wahyuni, F. S., Zakaria, Widyaningrum, R., Saputra, D., Prihastari, E. B., Ramadani, S. D., & Nurhayati, R. (2021). *Perencanaan Pembelajaran di Sekolah Teori dan Implementasi*. Pradina Pustaka.
- Munawar, S., Heryanti, E., & Miarsyah, M. (2019). Hubungan Pengetahuan Lingkungan Hidup dengan Kesadaran Lingkungan pada Siswa Sekolah Adiwiyata. *LENZA (Lentera Sains): Jurnal Pendidikan IPA*, 9(1), 22–29.
- Nofiana, M., & Julianto, T. (2018). Upaya Peningkatan Literasi Sains Siswa melalui Pembelajaran berbasis Keunggulan Lokal. *Biosfer: Jurnal Tadris Biologi*, 9(1), 24–35.
- Nurwidodo, N., Amin, M., Ibrohim, I., & Sueb, S. (2020). The Role of Eco-School Program (Adiwiyata) towards Environmental Literacy of High School Students. *European Journal of Educational Research*, 9(3), 1089–1103.
- Nurwidodo, Romdaniyah, S. W., Sudarmanto, S., Rosanti, D., Kurniawati, K., & Abidin, Z. (2021). Analisis Profil Berpikir Kritis, Kreatif, Keterampilan Kolaboratif, dan Literasi Lingkungan Siswa Kelas 8 SMP Muhammadiyah sebagai Impak Pembelajaran Modern. *Bioscientist: Jurnal Ilmiah Biologi*, 9(2), 605–619.
- Ozsoy, S., Ertepinar, H., & Saglam, N. (2012). Can Eco-Schools Improve Elementary School Students' Environmental Literacy Levels? *Asia-Pacific Forum on Science Learning and Teaching*, 13(2), 1–25.
- Pahleviannur, M. R., & Hafida, S. H. N. (2022). Determination of Priority Pillars of Safe School Facilities in Supporting the Realization of Disaster-Safe Education Unit (SPAB) Program in Public High School 1 Karangdowo, Klaten District, Central Java Province. *Jurnal Geografi, Edukasi Dan Lingkungan (JGEL)*, 6(1), 17–25.

<https://doi.org/10.22236/jgel.v6i1.7834>

- Prabumukti, D. R., & Widiyatmoko, W. (2021). *Penerapan Konsep Sekolah Adiwiyata dan Kepedulian Lingkungan bagi Siswa SMA Negeri 3 Surakarta*. Universitas Muhammadiyah Surakarta.
- Prastiwi, L., Sigit, D. V., & Ristanto, R. H. (2020). Hubungan antara Literasi Ekologi dengan Kemampuan Memecahkan Masalah Lingkungan di Sekolah Adiwiyata Kota Tangerang. *Jurnal Pendidikan Matematika Dan IPA*, 11(1), 47–61.
- Pratama, A. Y., Marpaung, R. R., & Yolida, B. (2020). Pengaruh Literasi Lingkungan Terhadap Environmental Responsibility Siswa Kelas XI SMA Negeri 2 Bandar Lampung. *Jurnal Bioterdidik: Wahana Ekspresi Ilmiah*, 8(1), 56–65.
- Rafidah, H. N., & Rachmadiarti, F. (2022). Pengembangan E-Book berbasis Collaborative Learning pada Submateri Pencemaran Lingkungan untuk Melatih Keterampilan Literasi Sains Kelas X SMA. *Berkala Ilmiah Pendidikan Biologi (BioEdu)*, 11(2), 418–433.
- Rakhmawati, D., Prasetyo, A. P. B., & Ngabekti, S. (2016). Peran Program Adiwiyata dalam Pengembangan Karakter Peduli Lingkungan Siswa: Studi Kasus di SMK Negeri 2 Semarang. *Unnes Science Education Journal*, 5(1).
- Ramadhan, S., Sukma, E., & Indriyani, V. (2019). Environmental Education and Disaster Mitigation through Language Learning. *IOP Conference Series: Earth and Environmental Science*, 314(1), 12054.
- Ramadhani, L. A., Sulistiani, I. R., & Sulistiono, M. (2021). Implementasi Program Sekolah Adiwiyata dalam membentuk Pendidikan Akhlak Siswa di SD Negeri Dinoyo 1. *JPMI: Jurnal Pendidikan Madrasah Ibtidaiyah*, 3(1), 51–59.
- Rijanta, R., Hizbaron, D. R., & Baiquni, M. (2018). *Modal Sosial dalam Manajemen Bencana*. UGM PRESS.
- Rokhmah, Z., & Fauziah, A. N. M. (2021). Analisis Literasi Lingkungan Siswa SMP pada Sekolah Berkurikulum Wawasan Lingkungan. *PENSA: E-JURNAL PENDIDIKAN SAINS*, 9(2), 176–181.
- Saddhono, K., Rohmadi, M., Rondiyah, A. A., Purwiyanti, Y., Suhita, R., Sudaryanto, M., Anindyarini, A., Romadlon, M. R., Sudigdo, A., & Purwanto, W. E. (2019). Adiwiyata Insight: Information Technology based Environmental Education at Senior High School in Boyolali, Central Java. *Journal of Physics: Conference Series*, 1339(1), 12121.
- Safitri, W. I., Suryawati, E., & Yustina, Y. (2020). Environmental Literacy Analysis of Junior High School Students in Pekanbaru. *Journal of Educational Sciences*, 4(1), 116–123.
- Santoso, R., Roshayanti, F., & Siswanto, J. (2021). Analisis Literasi Lingkungan Siswa SMP. *JPPS (Jurnal Penelitian Pendidikan Sains)*, 10(2), 1976–1982.
- Sigit, D. V., Prastiwi, L., Ristanto, R. H., & Rifan, M. (2021). Adiwiyata School in Indonesia: A Correlation between Eco-Literacy, Environmental Awareness, and Academic ability with Environmental Problem-Solving Skill. *Journal of Physics: Conference Series*, 1796(1), 12068.
- Siswanto, S., Karimullah, K., Prasetyawati, R., & Nurhayati, N. (2019). Environmental Cultured Education and its Implication on the Student's Competencies in an Adiwiyata school. *Jurnal Cakrawala Pendidikan*, 38(3), 552–564.

- Sumarmi, S. (2016). Sekolah Hijau sebagai Alternatif Pendidikan Lingkungan Hidup dengan Menggunakan Pendekatan Kontekstual. *Jurnal Ilmu Pendidikan*, 15(1).
- Sumiati, D. L. (2021). Mewujudkan SMP Negeri 7 Probolinggo menuju Sekolah Adiwiyata Mandiri. *Jurnal Ilmiah Pro Guru*, 4(1), 1–10.
- Susilawati, W. O., Darniyanti, Y., Prasetyo, D. E., Apreasta, L., & Novitasari, A. (2020). Urgency of Adiwiyata School for Education as Sustainable Development. *Journal of Education and Learning (EduLearn)*, 14(4), 543–549.
- Tcyplakova, E. G., Sinko, G. I., Purina, N. M., Yankevich, Y. G., & Yankevich, K. A. (2021). Environmental Consequences of Recreational Vehicle Impact. *IOP Conference Series: Earth and Environmental Science*, 723(4), 42036.
- Veisi, H., Lacy, M., Mafakheri, S., & Razaghi, F. (2019). Assessing Environmental Literacy of University Students: A Case Study of Shahid Beheshti University in Iran. *Applied Environmental Education & Communication*, 18(1), 25–42.
- Yuliana, L. (2021). Pengembangan Buku Pedoman Pembelajaran Kimia Tematik Berbasis Adiwiyata. *Journal of Tropical Chemistry Research and Education*, 3(2), 85–98.
- Zhou, Y., Li, Y., & Liu, Y. (2020). The Nexus between Regional Eco-Environmental Degradation and Rural Impoverishment in China. *Habitat International*, 96, 102086.