



The role of adiwiyata school in the change of students' knowledge, attitude, and behavior towards the environment

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Abstract. *Environmental problems and their solutions must be introduced to students from an early age through Environmental Education (PLH). One of PLH's implementations is the Adiwiyata Program. The success of the Adiwiyata Program can be measured by examining differences in knowledge, positive attitudes, and positive behavior toward environmental problems and solutions. This study aimed to analyze quantitatively and qualitatively differences in knowledge, positive attitudes, and positive behavior regarding the environment in school that has participated and that who has not participated in the Adiwiyata Program. Data were analyzed using a Likert scale with three categories: 1) good, 2) quite good, and 3) not good. Mann-Whitney U Test analysis was conducted to test the significance of the difference between the two groups of respondents. There was a difference in knowledge, attitudes, behavior, and PLH scores in schools that have participated in the Adiwiyata Program and that who has not. There was also a difference in student knowledge but not significant, between schools participating in the Adiwiyata Program and not participating in the program. Students who participated in the Adiwiyata Program had better PLH scores than those who did not follow the Adiwiyata program.*

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INTRODUCTION

Some areas of Sukoharjo Regency, such as Kartosuro, Grogol, and Sukoharjo sub-districts, are the buffers of Surakarta City. The impact of Surakarta City's economic activity will widen these buffer areas, which does little to cause a decrease in environmental quality (Marbun 1990; Inoguchi et al. 2015), as happened in Sukoharjo, namely water pollution, garbage, air pollution, hazardous waste and Toxic (Sukoharjo Regency Government 2020). One of the local problems that contribute to global warming is the increase in CO₂ emissions, which has caused the earth's temperature to rise by about 0.6 °C over the last 140 years (Wani et al. 2013; Shahzad and Riphah 2015). The significant impact of global warming is now starting to be felt, namely climate change, resulting in climate anomalies such as extreme rainfall, extreme drought, rising sea levels, and tidal flooding. Another issue that is no less important is the decline in biodiversity (Sutarno and Setyawan 2015).

Various efforts need to be made to slow down the process of environmental degradation by involving various stakeholders. Handling problems is not only the government's responsibility, but all elements of society

also share it. Schools are elements of society that have the task of creating the next generation who care about environmental sustainability. The introduction of environmental problems and efforts to solve them must be instilled in students from an early age through environmental education (*Pendidikan Lingkungan Hidup/PLH*). Environmental education is in accordance with the Sustainable Development Goals (SDGs) Program, which has the main target of ensuring a healthy life and promoting prosperity for all. One of the targets to be achieved in the SGDs program is poverty, education, and health (Perpres 2017). Education as one of the goals of SGDs is aimed at realizing quality education. With the realization of quality education, quality human resources will be created.

One of the implementations of PLH is the Adiwiyata Program, which is a collaboration between the Ministry of Environment and Forestry and the Ministry of Education and Culture. This program is often called the Green School, which aims to encourage the creation of knowledge and awareness of school residents in an effort to preserve the environment, which is a strategy to accelerate the implementation of PLH on a voluntary formal pathway (Permen LH 2013). The success of PLH requires a long process, facility support, and the adequacy and qualification of adequate human resources. According to the principle of "sustainability", the research results of Rushayati et al. (2017), who implement PLH in oil palm plantations, indicate the need for assistance with continuous programs. Tompodung et al. (2017) conducted research in Depok City schools that the Adiwiyata Program was effective in producing green behavior for school residents. Knowledge has a positive effect on attitude, then attitude has an important effect on environmental behavior (Siswono et al. 2012).

The success of the Adiwiyata Program can be measured by assessing the increase in knowledge, positive attitudes, and positive behavior toward environmental problems faced and solutions implemented. Therefore, it is necessary to do a comparison of knowledge, positive attitudes, and positive behavior between students in schools that have received the Adiwiyata Program award and schools that have not received the award. Madrasah Ibtidaiyah Muhammadiyah 1 Sukoharjo Regency (MIM 1) was selected as a school that had received the Adiwiyata Program award, while Madrasah Ibtidaiyah Muhammadiyah Sonorejo (MUHSON) was selected as a school that had not received the Adiwiyata Program award. Based on this, the research objective is to obtain quantitative and qualitative differences in knowledge, positive attitudes, and positive behavior regarding the environment in schools that have participated and those who have not participated in the Adiwiyata Program.

METHODS

Location and Time of Research

The research was conducted at Madrasah Ibtidaiyah Muhammadiyah 1 Special Program (PK) Sukoharjo which is located at Jalan Manggar, Joho, Sukoharjo District, Sukoharjo Regency, Central Java Province. This Madrasah Ibtidaiyah is in the process of submitting the National Adiwiyata Program. In comparison, Madrasah Ibtidaiyah Muhammadiyah Sonorejo, Sukoharjo Regency, Central Java Province, has not participated in the national Adiwiyata Program. The research was conducted from April to July 2022.

Data Collection

The data was obtained from filling out questionnaires by the fifth-grade students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo and fifth-grade students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo. Data regarding the knowledge, attitudes, and behavior of respondents as well as the overall value of the implementation of environmental education in schools from the two schools, were obtained from questionnaires filled out by respondents. The questionnaire contained questions about the criteria of Adiwiyata schools according to Appendix 1 of the Minister of Environment Regulation Number 5 of 2013 concerning Adiwiyata Program Implementation Guidelines, which comprised the following aspects: (a) environmentally sound school policies; (b) environment-based school curriculum; (c) participatory school activities in the field

of PLH; and (d) management of school supporting facilities and infrastructure that are environmentally friendly.

Data Analysis

Knowledge analysis was carried out by assessing the answers to questions related to the environment at school and around the respondent's neighborhood. While the data analysis of knowledge, attitudes, and behavior using a Likert scale is classified into three groups, namely: 1) good, 2) quite good, and 3) not good. To test the significance of differences in knowledge, attitudes, behavior, and overall values of environmental education from the two independent groups MIM 1 PK Sukoharjo and MIM Sonorejo Sukoharjo, Mann Whitney U Test analysis was used. Mann Whitney U Test is a non-parametric statistical test to determine the significance of differences between two independent groups with ordinal, interval, or ratio scales. The hypothesis on the Mann-Whitney U test is as follows: H0: There is no significant difference between the two independent groups; and H1: There is a significant difference between the two independent groups (With a p-value < 0.05, then H0 is rejected, and H1 is accepted).

RESULT AND DISCUSSION

Knowledge

The realm of knowledge includes the ability to restate concepts or principles that have been studied, which relates to thinking skills, competence to acquire knowledge, introduction, understanding, conceptualization, determination, and reasoning. Learning objectives in the cognitive (intellectual) domain, which according to Bloom (1956) are all activities involving the brain, are divided into 6 levels according to the lowest to the highest level, which is symbolized by C (Cognitive). Knowledge is the result of knowing and is formed after someone senses a certain object. Factors that influence knowledge are internal and external. Internal factors are education and age. External factors are environment and culture. Based on the results of the knowledge analysis of the respondents, as many as 49 students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo, and 44 students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo, it was found that 82% of students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo, and 84% students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo had lacking environmental knowledge that must be improved. The results of the respondent's knowledge analysis are presented in Figure 1.

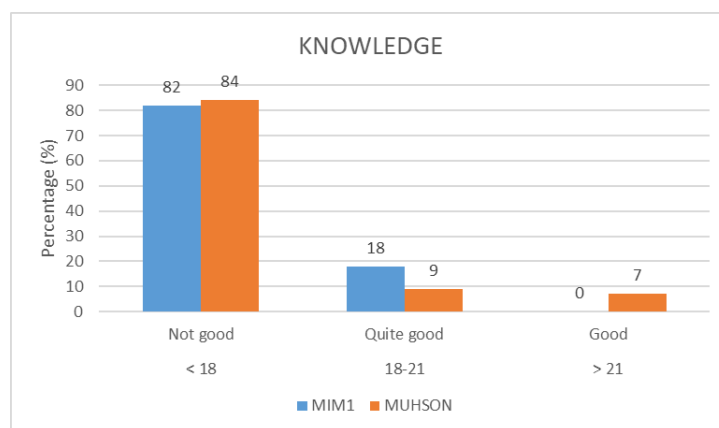


Figure 1 Students' environmental knowledge

Knowledge of students who are included in the sufficient level at Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo was as much as 18%, while students at Madrasah Ibtidaiyah Muhammadiyah Sonorejo was 9%. Students who belonged to the group with good environmental knowledge were 0% for Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo, and 7% of students for Madrasah Ibtidaiyah Muhammadiyah Sonorejo.

Based on the results of students' knowledge analysis, both schools still need improvements, including Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo, which has implemented a curriculum according to the criteria of Adiwiyata schools and even has owned a module about the environment.

Attitude

Attitude is a reaction or response that is still closed from a person to a stimulus or object. Attitude is a readiness or willingness to act and is not the implementation of a particular motive. So based on the above understanding, the attitude is closed and is a predisposition to a person's behavior towards a stimulus. Attitudes enter into the affective domain, namely the realm related to attitudes, values, feelings, emotions, and the degree of acceptance or rejection of an object in learning activities. Attitude is a reflection of one's soul and is a way to communicate feelings to others. The most effective attitude formation is through own experience. The experience possessed will play a role in shaping one's cognition and feelings towards certain attitude objects that can be used to determine a person's behavioral tendencies (Hutagalung 2007).

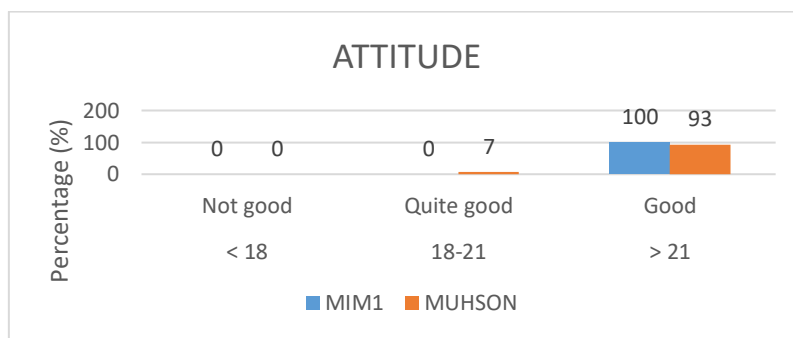


Figure 2 Students' attitudes towards the environment

Based on data analysis from student respondents of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo and Madrasah Ibtidaiyah Muhammadiyah Sonorejo, as depicted in Figure 2, there were no student attitudes that were included in the poor classification (value < 18). The attitude of students who were included in the moderate classification (Likert scale score 18 - 21) was 0% for students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo, and 7% for students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo. The attitude of students that were included in the good classification was 100% for students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo and 93% for students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo. The attitude of the students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo 100% belonged to the good category as it is supported by the fulfilled criteria of adiwiyata schools, namely school policy, curriculum, activities (adiwiyata criteria implementation), and facilities and infrastructure.

Behavior

Behavioral intention is the main predictor in determining behavior. Intentions are the bridge between attitudes, subjective norms, and behavioral control over actual behavior. According to Ajzen (2005) intention is an indication of how hard a person tries or how much effort is made to display behavior. According to Schiffman and Kanuk (2007), behavioral intention is related to a person's tendency to perform a certain action or behavior. Environmental care behavior intention is a person's tendency to conduct environmentally friendly behavior based on trust and belief in something as well as one's abilities. The analysis results of the students' behavior are presented in Figure 3.

The behavioral scores of students at Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo were 4% poor, 8% moderate, and 88% good. Meanwhile, for the students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo, 5% were less, 43% were moderate, and 52% were good. Environmental activities have been programmed in

schools, supported by active teachers and full support from the principal, having a positive impact on student behavior. The higher percentage of behavior that was considered good in Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo compared to Madrasah Ibtidaiyah Muhammadiyah Sonorejo was due to the criteria of Adiwiyata schools (school policies, curriculum, activities, as well as facilities and infrastructure) which have been carried out by Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo.

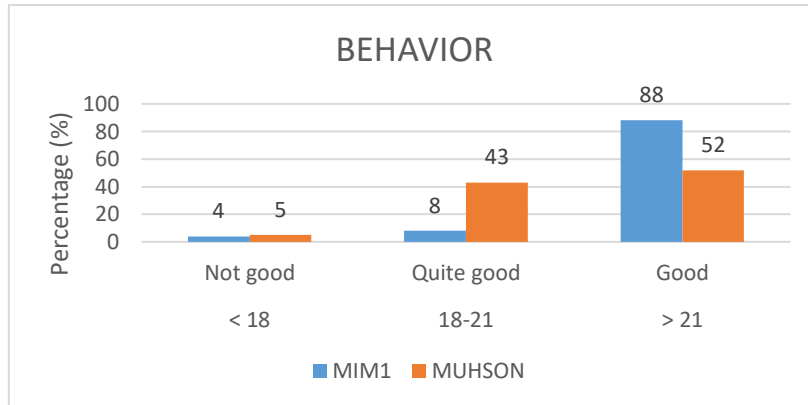


Figure 3 Student behavior toward the environment

Environmental Education (PLH)

Based on the results of data analysis of the knowledge, attitudes, and behavior of students in environmental education activities presented in Figure 4, it can be concluded that students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo were better than students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo. This is proven by the good scores of PLH, which were higher than the students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo. However, students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo have the potential to increase their score on environmental education activities based on the results of higher knowledge score analysis, and the moderate scores of PLH were much higher (43%) than students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo (8%). Thus, it has the potential to become a school with students with good PLH scores.

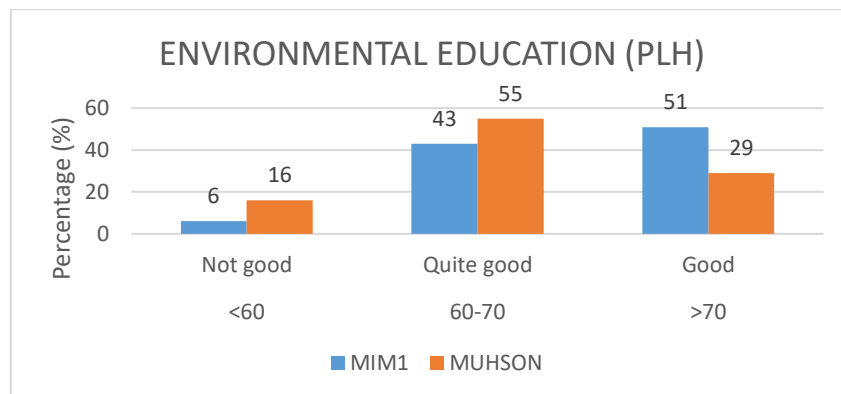


Figure 4 Students' environmental education

Based on the results of the Mann Mann-Whitney U test analysis presented in Table 1, the two variables had significant differences in the two independent groups with a p-value of $0.01014 < 0.05$ for the attitude variable and $0.005754 < 0.05$ for the behavioral variable. The other two variables, namely the knowledge variable and the PLH score variable, did not have a significant difference, with a p-value of $0.1507 > 0.05$ for the knowledge variable and $0.06687 > 0.05$ for the PLH value variable.

Table 1 Results of the mann whitney U test analysis

No.	Variable	p-value	Result
1	Knowledge	0.1507	Not significant
2	Attitude	0.0101	Significant
3	Behavior	0.0058	Significant
4	PLH score	0.03991	Significant

There was a difference in knowledge but not significant, between students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo Regency and students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo. Meanwhile, in terms of the attitudes, behavior, and scores of PLH between the two schools, there was a significant difference, namely students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo Regency were better than students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo. The values of knowledge, attitudes, behavior, and PLH scores from the two schools are presented in Table 2. Based on Table 2, the difference in knowledge values between the two schools was not significant, while the values of attitudes, behavior, and PLH scores between the two schools were significantly different, with better scores for students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo Regency compared with students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo.

Table 2 Mann-whitney U test results

No	School	Knowledge	Attitude	Behavioral	PLH
1	MIM I PK Sukoharjo	12.12a	26.02b	23.59b	68.81b
2	MIM Sonorejo	13.30a	24.41a	21.98a	66.28a

Note: The numbers followed by the same letter do not show a significant difference at the 95% confidence interval ($\alpha = 0.05$)

Tompondung et al. (2017) stated that the Adiwiyata Program increases students' awareness of the environment. This is in accordance with the results of the analysis of the PLH scores for Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo Regency students who have participated in the Adiwiyata Program and are even currently proposing to become a National Adiwiyata School which is higher than schools that have not participated in the Adiwiyata program (Madrasah Ibtidaiyah Muhammadiyah Sonorejo). The Adiwiyata program, with various activities that have been carried out in schools has proven to be effective in increasing the environmental knowledge of school residents, as well as changing attitudes and environmentally friendly behavior of school residents.

CONCLUSION

Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo Regency has implemented all the criteria of Adiwiyata schools, while Madrasah Ibtidaiyah Muhammadiyah Sonorejo has yet to join Adiwiyata school program. There are differences in knowledge, attitudes, and behavior as well as PLH scores between schools that have participated in the Adiwiyata Program (Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo Regency) and those that have not participated in the Adiwiyata Program (Madrasah Ibtidaiyah Muhammadiyah Sonorejo). There was a difference in student knowledge but not significant, between schools participating in the Adiwiyata Program and those not participating in the program.

Meanwhile, in terms of attitudes, behavior, and scores of PLH between the two schools, there was a significant difference between students of Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo Regency that was better than students of Madrasah Ibtidaiyah Muhammadiyah Sonorejo. Although the attitudes, behavior, and scores of PLH Madrasah Ibtidaiyah Muhammadiyah 1 PK Sukoharjo Regency were good, it is still necessary to increase knowledge about the environment. Madrasah Ibtidaiyah Muhammadiyah Sonorejo has

good potential to become an adiwiyata school, so it needs to be encouraged to immediately prepare to become an adiwiyata school.

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