



Agroschooling education: primary school students' efforts to improve environmental literacy skills

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Abstract

Agroschooling is a practice-based learning approach developed to enhance students' ecological awareness through active engagement in agricultural activities within the school environment. Studies specifically examining the contribution of Agroschooling to strengthening environmental literacy among elementary school students remain limited, particularly regarding the development of ecological understanding through contextual, applied, and sustainable learning experiences from an early age. This study aims to analyze the contribution of the Agroschooling program in strengthening environmental literacy among elementary school students through collaborative learning activities oriented toward sustainability principles. This study employs a qualitative approach with a descriptive design conducted at SD Inpres Nontotera, Bima Regency. The research informants consist of the school principal, the vice principal for curriculum, one classroom teacher, and ten fifth-grade students. Data collection techniques include participatory observation, in-depth interviews, and documentation. Data analysis used the Miles and Huberman interactive model, which includes the stages of data collection, data reduction, data presentation, and drawing conclusions. The research findings indicate that the implementation of Agroschooling is effective in enhancing students' understanding of environmental literacy, fostering a sense of care and responsibility toward environmental sustainability, and strengthening their motivation to learn through enjoyable collaborative activities. The gardening skills students acquire are also applied within the family environment, thereby creating a broader and more sustainable learning impact. Agroschooling has proven effective in comprehensively building environmental literacy among elementary school students, encompassing cognitive, affective, and psychomotor aspects from an early age.

Keywords: Agroschooling 1; Primary School Students 2; Environmental Literacy 3; Attendance Motivation 4; Real Learning 5.

INTRODUCTION

Environmental literacy is a fundamental aspect in shaping individuals who are knowledgeable, aware, and behave in an environmentally friendly manner (Suhendar et al., 2023). This literacy not only encompasses factual knowledge about the environment, but also critical and reflective thinking skills, as well as a willingness to actively participate in maintaining ecosystem sustainability (Shutaleva, 2023). The development of environmental literacy from an early age is of high urgency because during this period children are in the stage of

forming character values and lifestyle habits that will determine their attitude towards nature in the future. Through contextual and meaningful learning activities, students can internalize values of ecological concern, foster a sense of responsibility towards the environment, and build awareness of the importance of sustainable living patterns (Rustamova, 2023).

Basic education plays a crucial role in developing students' environmental literacy (Huang & Hsin, 2023). At the primary school level, learning serves not only as a means of knowledge transfer, but also as a vehicle for

shaping attitudes and behaviors that care for the environment. Through learning that is relevant to everyday life, schools can become strategic spaces for introducing ecological principles and instilling moral values that favor nature conservation (Gitmiwati & Indrayuda, 2024). Learning based on real experiences, such as observation activities, simple experiments, and hands-on practice in the school environment, can improve children's ability to understand, love, and care for the environment with a sense of responsibility (AlAli & Al-Barakat, 2024). These efforts are an important foundation for shaping a generation that has ecological awareness and is committed to environmental sustainability (Korotenko & Togusakov, 2024).

The learning process at the primary level is still dominated by a theoretical approach that does not provide sufficient opportunities for students to interact directly with nature (Marougkas et al., 2023). Schools have great potential to function as ecological learning laboratories through activities that integrate knowledge, skills, and character building (Suarlin, 2023). The limitations of real-world experiences in learning demand educational innovations that are applicable and contextual (Omelianenko & Artyukhova, 2024). One relevant alternative is the implementation of the Agroschooling model, which is a learning approach based on farming activities and sustainable school land management (Triyono et al., 2024). Through this model, students not only learn to understand ecological concepts, but also practice critical thinking, collaboration, and develop a sense of social responsibility towards the environment (Amalia, 2024).

Several previous studies have examined the implementation of Agroschooling education in schools (Iduard et al., 2025; Jufri et al., 2025; Saputra et al., 2025; Effendy et al., 2024; Maulana et al., 2024; Patintingnan et al., 2024; Fitriani et al., 2023; Holloway et al., 2023; Masadi et al., 2023; Sitinjak, 2023). Sitinjak (2023) stated that Agroschooling effectively improves students' ecological thinking and sustainable behavior through direct learning experiences. In

primary schools with sufficient land, the implementation of Agroschooling is an innovative strategy to ensure that the land is not left vacant and can be used for educational purposes. (Maulana et al., 2024) explain that through activities such as planting, caring for, and harvesting crops, students gain concrete experiences that deepen their understanding of ecological processes and the relationship between humans and nature. These activities also foster responsibility, independence, and concern for the environment.

The implementation of agroschooling serves as a contextual learning medium that integrates theory and practice in a balanced manner (Njura et al., 2020). Through this approach, students not only gain a conceptual understanding of the principles of ecology and sustainable agriculture but also develop character values such as discipline, responsibility, and the ability to work together in group activities. The active involvement of students in managing school grounds can increase their sense of ownership of the environment while fostering ecological empathy. Agroschooling is not only a means of knowledge transfer but also a vehicle for character building and developing an environmentally conscious attitude oriented towards sustainability (Goldman & Alkaher, 2024).

School land management through Agroschooling activities can be an educational tool that not only strengthens environmental literacy but also fosters agricultural entrepreneurship skills in students (Pebrianto et al., 2025). Through practice-based learning, students are trained to think creatively, productively, and independently manage land yields, thereby fostering independence and social responsibility. Farming activities at school contribute positively to students' physical health, emotional well-being, and social skills (Lohr et al., 2020). Agroschooling has strategic potential in shaping students who are not only environmentally conscious but also competitive, independent, and socially resilient in facing the challenges of sustainable development (Dutta et al., 2023).

The literature shows that there has not been much research specifically highlighting the role of Agroschooling in improving environmental literacy, particularly among primary school students who are at a critical stage in the formation of ecological values and character. This study aims to analyze in depth the contribution of Agroschooling education to the development of environmental literacy among primary school students through contextual, applicable learning activities oriented towards the principles of sustainability.

RESEARCH METHODS

This study utilized a qualitative approach with a descriptive design. A qualitative approach with a descriptive design is a research approach that focuses on understanding the meanings, experiences, and perceptions of participants and aims to provide an in-depth description of a situation or phenomenon (Lim, 2024). The qualitative approach was chosen because it allows researchers to understand and describe phenomena in depth based on the natural context that occurs in the field. Data collection in this study was conducted using participatory observation, in-depth interviews, and documentary analysis as the primary techniques. These three techniques were applied in an integrated manner through a triangulation approach to enhance the validity, comprehensiveness, and credibility of the data, ensuring that the information obtained accurately represents the phenomena under study and is scientifically accountable. This approach is descriptive because it seeks to describe empirical reality as it is using narratives or verbal descriptions rather than numerical data. This type of research is classified as field research, in which researchers directly observe and interact at the research location to obtain factual information about the implementation of the Agroschooling program. The location of this research was at SD Inpres Nontotera, Bima Regency, which was the site for the implementation of the Agroschooling program and the main source of research data. The informants involved in this research

consisted of the Headmaster (HM), Deputy Head of Curriculum (DHC), one Class Teacher (OCT), and ten Grade 5 Students (S) to gather the necessary information and data. The research flow is illustrated in Figure 1.

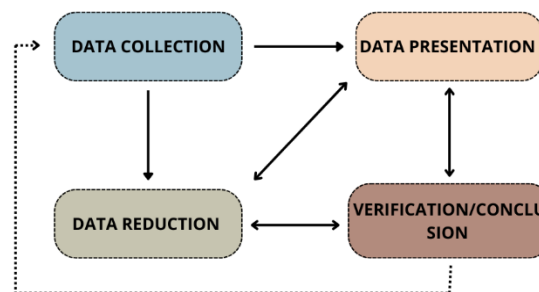


Figure 1.
Data Analysis Flow Components (Miles et al., 2014)

Figure 1 shows that data analysis in this study refers to the Miles and Huberman model, which consists of four main components, namely data collection, data reduction, data presentation, and conclusion drawing. First, data collection was carried out through participatory observation of Agroschooling activities at SD Inpres Nontotera, conducting interviews with informants, and collecting documentation in the form of photographs and students' work that reflected their involvement in environmental literacy practices. Second, data reduction was carried out by selecting, simplifying, and focusing on relevant information in order to present a clear picture of the students' ecological understanding and participation. Third, data presentation (display data), after all data was obtained and reduced, the data related to Agroschooling activities and the improvement of students' environmental literacy was presented descriptively and explained based on valid findings regarding the forms of involvement, ecological understanding, and behavior patterns of students during the activities. Fourth, conclusions are drawn by interpreting the meaning of the data that has been systematically analyzed thereby obtaining a deep understanding of the contribution of Agroschooling in improving environmental literacy.

RESULTS AND DISCUSSION

1. Implementation of the Agroschooling Program in Primary Schools

The implementation of the Agroschooling program is one of the educational strategies to develop students' environmental literacy through hands-on activities. This program does not only serve as an additional activity but has been integrated into the regular learning process and school routines. The implementation of the Agroschooling program was motivated by the ecological conditions in the Bima region, which is experiencing serious environmental pressure, particularly in relation to the increase in deforestation practices. The results of interviews conducted with (DHC) explain that :

“The Agroschooling program was established because we observed that the environment in the Bima region was facing a serious problem, namely deforestation. This situation would inevitably lead to an increased risk of flooding and ecosystem damage. Therefore, we took the initiative to implement the Agroschooling program in the hope that it would increase the ecological awareness of the students.”

Agroschooling provides a meaningful learning experience where students are directly involved in the farming process, thereby increasing their understanding of the environment and fostering a sense of care for ecosystem sustainability. The Agroschooling program is implemented by utilising school land that was previously underutilized and transforming it into an educational area for students. The activities carried out include preparing the planting medium, planting seeds, and regularly caring for the plants according to a structured schedule, as shown in Figure 2 below.



Figure 2.

Implementation of the Agroschooling Programme

Figure 2 shows the implementation of the Agroschooling program in primary schools, which emphasizes the active participation of students in farming activities as a means of environmental learning. The first photo shows the initial stage of preparing seeds and planting media using simple materials available around the school. The second photo shows the students working together to fill polybags with soil as part of the planting process. This demonstrates the application of systematically designed practice-based learning so that students not only learn environmental concepts theoretically but also gain direct experience that strengthens their understanding and ecological awareness. (HM) revealed that :

“The main objective of Agroschooling is to foster students' awareness of their surroundings and the environment. Primary school pupils still love to play and get bored with monotonous learning processes. Through Agroschooling, the learning process becomes more interesting because pupils not only learn theory in the classroom but also put it into practice

immediately, so they are much more enthusiastic about learning, especially in science subjects, because they enjoy learning outside the classroom.”

The implementation of Agroschooling is not merely aimed at delivering material about the environment but rather emphasizes the direct involvement of students in real activities so that the learning process becomes more contextual and meaningful. Agroschooling is integrated into project-based learning and is part of *Proyek Penguatan Profil Pelajar Pancasila (P5)*, sebuah program ekstrakurikuler yang dirancang untuk memperkuat karakter, kompetensi, dan nilai-nilai siswa sesuai dengan kerangka Profil Pelajar Pancasila. so that its implementation is not merely an extracurricular activity. Students work in groups so that gardening activities become a collaborative learning vehicle that encourages positive interaction and shared responsibility. The results of the students' plant development are used as one of the bases for evaluating the program which is carried out at the end of each planting period.

2. The Role of Teachers and the Learning Process in Developing Environmental Literacy

Teachers play a strategic role in ensuring the successful implementation of the Agroschooling program in primary schools. As facilitators, teachers provide technical guidance by demonstrating the correct planting procedures. All activities are designed to be in line with the Natural and Social Sciences (IPAS) learning materials, which cover studies on the needs of living things, stages of plant growth, and the concept of ecosystem balance. (OCT) said that :

“During Agroschooling activities, I fully accompany the students. I first demonstrate how to prepare good planting media. I also teach them the correct planting techniques and ensure that my students truly understand what I have explained and done. I also always accompanied them in caring for the plants that had been planted, such as watering them and cleaning up litter from the planting area, so that the students would

better understand the importance of caring for plants as living things that also need attention.”

The role of teachers in Agroschooling activities shows that environmental learning is built through an intensive mentoring process from the preparation stage of planting to plant care. Through this practice-based approach, learning is not limited to theoretical explanations in the classroom but is created through real interaction with the environment, thereby encouraging the formation of more comprehensive and meaningful environmental literacy. As shown in Figure 3 below :



Figure 3.

Teachers assisting students with planting

Figure 3 shows the outdoor learning process involving teachers and students in planting activities as part of strengthening environmental literacy. The teacher is seen giving direct instructions on proper planting techniques, while the students sit around the work area and actively follow the instructions while practicing the steps shown. The interaction between teachers and students reflects a collaborative and practical learning atmosphere, where direct experience in the field serves as a means to deepen students' understanding of the planting process and basic ecological principles. The learning approach used includes demonstrations, hands-on practice, simple discussions, and group work. Teachers also instilled environmental awareness values through routine habits such as sorting waste, maintaining school cleanliness, and not damaging plants.

3. The Impact of the Agroschooling Program on Improving Students' Environmental Literacy

The implementation of the Agroschooling program contributes significantly to the development of environmental literacy among students through a practice-based learning approach. Planting and caring for plants in the school garden allows students to gain first-hand experience that integrates knowledge, attitudes, and environmentally friendly behavior. This program not only conveys theoretical concepts but also builds contextual understanding that connects lesson material with real experiences in the school environment. The impact can be seen in Figure 4.

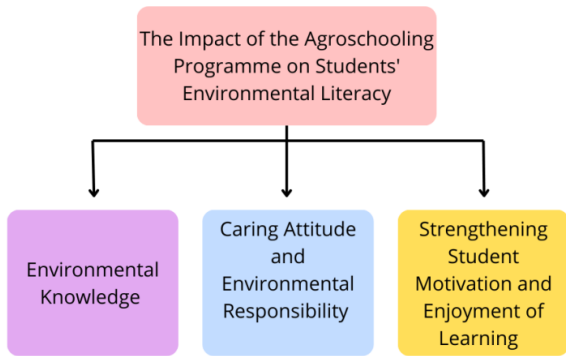


Figure 4.

Impact on Students

Figure 4 shows that there are three main components that form the basis of the analysis of the impact of the Agroschooling program on primary school students. These three components include environmental knowledge, caring attitudes and ecological responsibility, and student motivation and enjoyment of learning in garden-based learning processes. To support this visual interpretation, Figure 5 is also worth noting because it contains patterns of student responses that reinforce the consistency of the findings as illustrated in Figure 4.

	Total	Rata-Rata	Reponden
N	10	10	10
Missing	0	0	0
Mean	46.7		
Median	47.0		
Standard deviation	1.34		
Minimum	44		
Maximum	48		

Table 1.

Descriptives

Table 1. shows that the environmental literacy level of students after participating in the Agroschooling program was in the excellent category. From a total of 10 students who were respondents and with no missing data, the average score was 46.7 with a median of 47.0. This condition indicates that most students achieved high scores and had relatively similar levels of ability. The narrow score range, between 44 and 48, and a standard deviation of 1.34 confirm that the variation in ability between students is very low. These findings suggest that the implementation of Agroschooling is able to have an even and consistent effect in improving environmental literacy among primary school students.

a. The Improvement of Environmental Knowledge

Through planting and caring for plants, students have the opportunity to make direct observations so that learning does not stop at theoretical concepts but is supported by real experiences they have in the field. (S) said that :

“I enjoy learning how to plant with my friends. I can learn how to plant, and after planting, I realise that we have to take care of the plants so that they grow healthily. If the plants do not get enough sunlight, they will not grow well, and if they do not get enough water, they will also not grow well and may even fail to grow.”

The learning process through Agroschooling provides space for students to understand ecological concepts in depth through direct involvement in farming

activities. Continuous interaction with plants also helps students develop the ability to recognize signs of plant health, which is an essential part of science literacy at a basic level. Through this experience-based approach, students not only gain a more comprehensive understanding of the plant growth process but are also able to relate the information they have learned to real-life situations in their surroundings. This approach makes learning more relevant, meaningful, and in line with the principles of contextual learning in primary schools.

b. Developing an Attitude of Care and Responsibility for the Environment

A series of plant maintenance activities such as watering, keeping the garden area clean and caring for the growing medium help students understand that environmental sustainability requires consistent attention and action. (S) explains that :

“Once we have finished planting, we maintain the cleanliness of the environment. We do not litter in the planting area because it will disturb our plants. If any of our friends litter, we will immediately reprimand them and tell them that littering will damage the environment and the plants we have planted.”

The involvement of students in plant maintenance activities has fostered an understanding of the importance of responsible behavior towards the environment. Through direct experience of caring for plants, students have begun to realize that simple actions such as maintaining cleanliness and disposing of rubbish properly have real consequences for the survival of living things around them. Agroschooling activities not only strengthen ecological knowledge but also shape attitudes and habits that reflect ecological responsibility in everyday life.

c. Strengthening Student Motivation and Enjoyment of Learning

Motivation is important in the success of the learning process for students, and the Agroschooling program contributes significantly to student motivation. Students

are very excited when they learn outdoors, which provides them with real experiences and understanding of environmental concepts. Preparing the planting medium, planting, and caring for plants step by step creates an interesting learning atmosphere and stimulates students' curiosity about the plant growth process. (OCT) stated that:

“The students were seen to be more active in asking questions during the planting activities, and when I informed them that we would be planting or tending to the plants the following day, they appeared very enthusiastic, and almost all of the Year 5 students attended school. This proves that through the Agroschooling program students are more diligent in attending school to observe the growth of the plants they have planted.”

Learning in the school garden provides a more varied and enjoyable learning environment compared to learning in the classroom. Gardening activities also provide opportunities to strengthen social interaction, a sense of togetherness, and pride when students see the results of their work in the form of well-grown plants. (PD) states that :

“I am very happy when there are activities involving planting and caring for plants, because we don't get bored quickly as we are learning outside the classroom. My friends and I are happy when we see the plants we have planted growing well. At home, I often help my mother plant and care for chillies, spinach and okra, because I am already used to caring for the plants I have planted at school. So I know how to water them and what a good planting area looks like.”

The learning experience through Agroschooling activities has had a lasting impact on students' practical skills outside of school. The habit of carrying out a series of farming activities, from preparing the planting medium, watering appropriately, to caring for plants using the correct techniques, encourages students to apply these skills independently at home. This indicates that learning does not stop when the activity ends but also shapes students' independence and

confidence in managing sustainable farming activities. The direct experience provided through this program has proven to be able to extend the impact of learning to the context of daily life while strengthening the internalization of practical ecological knowledge and skills. These findings are in line with the results of research by Zuiker & Riske (2021) which revealed that garden-based learning contributes to an increase in practical horticultural skills that students can apply in their home environment. This is reinforced by research by (Demssie et al., 2022) which states that a practice-based learning approach is effective in encouraging the transfer of ecological skills to real-life contexts. A study Azevedo et al. (2022) also shows that student involvement in direct learning experiences has an impact on the formation of independent plant care habits.

Through repeated observations of plant growth dynamics, students began to understand that environmental factors such as soil moisture, light intensity, and the presence of pests have a real impact on plant growth quality. This awareness encouraged them to make appropriate decisions regarding the care measures that needed to be taken. A sense of ownership towards the plants they care for fosters a sense of responsibility, which is then reflected in their daily behavior, such as maintaining the cleanliness of the school environment and avoiding actions that could damage the ecosystem around them. These results are in line with the findings of (Gya & Bjune, 2021) which show that school gardening activities can increase students' ecological awareness. The consistency of these findings is also supported by research by (Jufri et al., 2025) which shows that involvement in group gardening activities strengthens students' social skills and increases their sense of responsibility. The study by Faganel & Kovač (2025) emphasizes that ecological experiences gained through direct interaction with the environment contribute significantly to shaping students' awareness and behavior in preserving, caring for, and appreciating the sustainability of their surrounding environment.

Several obstacles remain, such as discipline in plant maintenance, weather factors, and physical barriers to clearing land. Efforts to overcome these obstacles are carried out through more intensive teacher assistance and collaboration with parents in providing additional facilities. Agroschooling contributes significantly to building the environmental literacy of primary school students holistically through the integration of knowledge, skills, and the strengthening of environmental awareness. This is in line with the findings of Takkouch & DeCoito (2025) which emphasizes that the role and continuous support of teachers are important factors in maintaining the sustainability of school garden program. The consistency of these results is further reinforced by Austin (2021) study, which shows that active parental involvement can increase the effectiveness of students' gardening activities. Research by Wijaya & Hermawan (2025) shows that learning that utilizes direct experience through gardening activities has been proven to deepen students' understanding of ecological concepts, foster an attitude of caring for the environment, and develop practical skills more optimally than learning approaches that only focus on theory.

CONCLUSION

The implementation of the Agroschooling program in primary schools has proven highly effective in improving pupils' environmental literacy through direct involvement in farming activities combined with regular learning. Under the guidance of teachers, pupils gain practical experience that deepens their understanding of the basic needs of plants, stages of growth, and the interrelationships between components in the ecosystem. This activity not only strengthens cognitive aspects but also fosters environmental awareness, a sense of responsibility, and positive behavior including maintaining cleanliness and caring for plants in a sustainable manner.

The implementation of Agroschooling also increases students' motivation to learn, their ability to work together and their independence, and the farming skills they acquire can be applied at home. Although a

number of obstacles were encountered, such as irregular maintenance and the influence of weather conditions, the synergy between teachers, schools and parents was able to support the sustainability of the program. Overall, Agroschooling has a comprehensive impact on the development of students' ecological knowledge, skills and character. Future research is recommended to examine in greater depth the effectiveness of the Agroschooling program in the long term, particularly in relation to the sustainability of students' pro-environmental behavior and their ability to implement farming skills in the family environment and in the social context of the community.

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