IJE
Interdiciplinary Journal of Education
https://skillerindonesia.id/index.php/ije/index

Vol. 3, No 3: November2025
E-ISSN: 2988-7798
pp. 376-382
Email:ije@skillerindonesia.com

# Enhancing Sustainability Awareness Through AI-Assisted Learning Videos on Environmental Pollution: A Study in Fourth Grade Elementary School

**Arzetia Oktaviani[1], Suratmi[2*], Aswasulasikin[3], Dwi Cahaya Nurani[4]**
[1,2*]Department of Primary School Teacher Education, Faculty of Teacher Training and Education, Universitas Sriwijaya, Indonesia

*Corresponding Author Email: suratmi@fkip.unsri.ac.id

**Abstract:** Technology integration is crucial for modern education. This study investigates the use of Artificial Intelligence (AI)-assisted learning videos to enhance sustainability awareness among elementary students, an area where awareness remains low according to PISA data. A quantitative survey method was employed, utilizing a Likert-scale questionnaire to assess three aspects of sustainability awareness (behavioral, emotional, and practical) among 19 fourth-grade students at SDN 156 Palembang after video intervention. Results indicated a high level of sustainability awareness with a mean score of 3.5 (on a 4-point scale) and an overall percentage of 87.73%. All three aspects scored highly (86-89.2%), falling into the 'habits that are often/always done' category. The study concludes that AI-assisted learning videos are an effective tool for significantly improving sustainability awareness and behaviors in young learners, offering an innovative solution for environmental education.

**Article History**
Received: 14-08-2025
Revised: 01-11-2025
Published: 26-11-2025

**Key Words :**
Sustainability Awareness, Environmental Pollution, AI-Assisted Learning Videos, Elementary School Students

**How to Cite:** Oktaviani, A., Suratmi, S., Aswasulasikin, A., & Nurani, D. C. (2025). Enhancing Sustainability Awareness Through AI-Assisted Learning Videos on Environmental Pollution: A Study in Fourth Grade Elementary School. *IJE : Interdisciplinary Journal of Education*, *3*(3), 376–382. https://doi.org/10.61277/ije.v3i3.223

https://doi.org/10.61277/ije.v3i3.223



## Introduction

Education plays a role in transferring knowledge, skills, values, and attitudes from one generation to the next. One of the challenges faced today is the low awareness of students regarding environmental sustainability. Based on data from the Programme for International Student Assessment (PISA) in 2018, the level of student awareness regarding environmental issues is still relatively low (Suprayitno, 2019). This is due to the lack of integration of environmental education in the curriculum and the limited availability of technology-based learning facilities.

The Merdeka Curriculum is an education policy in Indonesia that aims to provide flexibility for schools and teachers in designing curricula that are tailored to the needs and characteristics of students. This concept focuses on developing individual potential, skills, and knowledge that are relevant to real life. In line with the development of the digital era, the curriculum in Indonesia continues to undergo updates (Uslan et al., 2021). One of the changes

IJE
Interdiciplinary Journal of Education
https://skillerindonesia.id/index.php/ije/index
Vol. 3, No 3: November2025
E-ISSN: 2988-7798
pp. 376-382
Email:ije@skillerindonesia.com

in the Merdeka Curriculum is the integration of science and social studies subjects at the elementary school level. The IPAS curriculum is designed with consideration of competency standards that cover science and social studies concepts in accordance with the environmental context.

Based on interviews with teachers of class IV C at SDN 156 Palembang, it was found that students' awareness of sustainability is still relatively low. Researchers also interviewed teachers regarding the use of educational videos in science subjects, particularly in science content. Although supporting facilities such as Wi-Fi, projectors, and laptops are available, their use is not yet optimal. As a result, the learning process still relies heavily on conventional media such as textbooks and blackboards, making the integration of sustainability awareness in learning less effective in the Society 5.0 era. Additionally, the limited time available for creating educational materials poses another challenge.

Digital-based learning media are tools used to create audio-visual formats (Mariyah et al., 2021). One type of learning media that teachers can utilize is educational videos. The use of videos can deepen students' understanding because it allows them to see visualizations and hear explanations of events that are difficult to observe directly, such as events in the past, objects of extreme size, or phenomena that occur over a long period of time. Thus, educational videos can help overcome these limitations, and the material can be replayed according to the needs of the students (Pamungkas & Koeswanti, 2022). Although instructional videos are known to be effective learning media, AI-assisted instructional videos offer additional advantages such as dynamic content creation, personalized educational materials, interactive elements, and the ability to provide real-time feedback, all of which can foster deeper learner engagement and understanding (Zawacki-Richter et al., 2019).

In line with the growing integration of artificial intelligence (AI) in educational settings, this study explores the potential of AI-assisted media to enhance students' engagement and understanding. Piclumen is an application used to generate text-to-image outputs according to the prompts provided. The resulting images produced by Piclumen are of high quality; the more detailed the prompt, the greater the consistency and accuracy of the generated images. Furthermore, this study employs Hailuo to develop instructional videos based on the images previously generated using Piclumen. Similar to Piclumen, Hailuo also relies on prompt-based input to produce its output. The integration of these AI-based applications is expected to support the creation of more interactive and visually engaging learning materials, thereby contributing to the development of students' sustainability awareness through technology-enhanced instruction.

This study aims to describe how students' sustainability awareness changes after using AI-assisted learning videos on environmental pollution material in fourth grade elementary school.

## Research Method

This study employed a quantitative approach with a pre-experimental design, specifically using a one-group pre-test/post-test design. This design was chosen to measure changes in students' sustainability awareness before and after the implementation of AI-assisted instructional videos. While this approach allows for the identification of differences between pre-test and



 

IJE
Interdiciplinary Journal of Education
https://skillerindonesia.id/index.php/ije/index
Vol. 3, No 3: November2025
E-ISSN: 2988-7798
pp. 376-382
Email:ije@skillerindonesia.com

post-test results, it is important to acknowledge that the sample size of only 19 fourth-grade students from class IV C at SDN 156 Palembang represents a limitation in terms of generalizability. This study employed a quantitative approach using a survey method. This method involves observation and in-depth research to present clear and high-quality information about a particular issue in a specific field (Muchlis, 2023). The data collection instrument used a questionnaire, which contained a series of statements that respondents were required to complete (Mulya, 2024). The primary data collection instrument was a questionnaire comprising 20 items, distributed evenly across three dimensions of sustainability awareness: sustainability behavior and attitude awareness, sustainability emotional awareness, and sustainability practice awareness. The categories of low, medium, and high in sustainability awareness are used to interpret the level of students' awareness of environmental sustainability based on the results of the questionnaire or research instrument. The instrument's validity was evaluated through expert judgment. The instrument was piloted with a limited group of 11 students. Although this sample size does not meet the ideal threshold for robust reliability analysis, Cronbach's Alpha was calculated as an initial indicator of internal consistency. The result yielded a coefficient of $\alpha = 0.87$, suggesting high reliability. However, this value should be interpreted with caution due to the small sample size.

**Table 1.** Levels of Sustainability Awareness

| Mean | Category |
|---|---|
| 1,00 – 2,00 | Low |
| 2,00 – 3,00 | Medium |
| 3,00 – 4,00 | High |

Source: Rini & Nuroso (2022)

The data obtained was also analyzed using percentage calculation techniques and descriptive analysis by applying the following formula.

$$Percentage = \frac{Total\ Points}{Total\ Score} \times 100\%$$

Source: Widiastika etc., (2021)

After the results of the questionnaire on students' sustainability awareness were obtained in percentage form using the formula, the next step was to interpret the data into the categories presented in the following table.

**Table 2.** Sustainability Awareness Percentage Categories

| Percentage of Sustainability Awareness | Description |
|---|---|
| 0% - 39,9% | Habits that are rarely done/disliked |
| 40% - 69,9% | Habits that have been practiced/are currently practiced at a moderate level |
| 70% - 100% | Habits that are often/always done/occur |

Source: Hasan etc., (2010)

IJE
Interdiciplinary Journal of Education
https://skillerindonesia.id/index.php/ije/index
Vol. 3, No 3: November2025
E-ISSN: 2988-7798
pp. 376-382
Email:ije@skillerindonesia.com

## Result and Discussion

After completing the sustainability awareness questionnaire, the results were analyzed by calculating the mean value. The following table shows the sustainability awareness categories of the students.

**Table 3.** Level of Sustainability Awareness Among Fourth Grade C Students

| Mean | Category |
|---|---|
| 3,5 | High |

To determine the extent to which students are aware of sustainability in their daily lives, a percentage calculation was performed. After obtaining the results of the student sustainability awareness questionnaire in percentage form, the next step was to interpret the data into sustainability awareness percentage categories.

**Table 4.** Percentage Categories of Sustainability Awareness among Grade IV C Students

| No. | Assisment Criteria | Score Obtained | Maximum Score | Percentage | Category |
|---|---|---|---|---|---|
| 1. | sustainability behaviour and attitude awareness | 88 | 100 | 88% | Habits that are often/always done/occur |
| 2. | sustainability emotional awareness | 86 | 100 | 86% | Habits that are often/always done/occur |
| 3. | sustainability practice awareness | 89 | 100 | 89,20% | Habits that are often/always done/occur |
| | Total | 263 | 300 | 87,73% | Habits that are often/always done/occur |

The results indicate that students in class IV C demonstrated a high level of sustainability awareness after learning with AI-assisted instructional videos. Among the three dimensions, practice awareness achieved the highest score (89.2%), suggesting that students are highly aware of daily sustainable actions such as saving water, reducing waste, and maintaining cleanliness.

The findings indicate that AI-assisted videos contributed to students' understanding and awareness of sustainability. This aligns with Pellas (2025), who found that AI-generated instructional videos enhance engagement and understanding in science learning.

The high score in practice awareness can be explained by the video's visual and demonstrative content, which presents real examples of sustainable behavior, making it easier for students to imitate and remember. This finding supports the concept of experiential learning

Vol. 3, No 3: November2025
E-ISSN: 2988-7798
pp. 376-382
Email:ije@skillerindonesia.com

in environmental education, where direct visualization of actions strengthens behavioral intentions (Hajj-Hassan et al., 2024).

However, emotional and attitudinal awareness scored slightly lower. These aspects are more abstract and may require longer reinforcement to internalize values and empathy toward the environment. As stated by Tilbury (2011), developing sustainable attitudes is a gradual process that involves reflection and continued exposure to environmental education.

Overall, the results suggest a positive shift in students' sustainability awareness, particularly in behavioral intentions. The limited sample size and focus on a single school restrict the generalizability of the results. Moreover, since data were collected immediately after the intervention, the short-term measurement cannot ensure that the observed awareness reflects lasting behavioral change.

## Conclusion

Based on three assessment aspects, namely sustainability behavior and attitude awareness, sustainability emotional awareness, and sustainability practice awareness. The results show that sustainability behavior and attitude awareness achieved a percentage of 88%, sustainability emotional awareness achieved a percentage of 86%, and sustainability practice awareness achieved a percentage of 89.20% in the category "Habits that are frequently/always done/occur." Overall, the total percentage of sustainability awareness among students after using AI-assisted learning videos on environmental pollution reached an average of 87.73%, categorized as "Habits that are frequently/always done/occur". The mean score of 3.5 indicates that the students' sustainability awareness is at a high level. This shows that the use of Artificial Intelligence-assisted learning videos has had a positive impact on increasing the sustainability awareness of fourth-grade students. Another advantage of Artificial Intelligence-assisted learning videos is their ability to facilitate interactive and engaging learning, so that students are more focused and interested in the material being presented. Therefore, the use of AI-assisted educational videos can be an effective alternative in improving students' understanding of science concepts, particularly regarding environmental pollution.

## Recommendation

Based on the findings, teachers are encouraged to integrate AI-assisted learning videos into environmental education to enhance students' sustainability awareness effectively. Future research is recommended to involve larger samples, longer intervention periods, and comparative designs to examine the long-term impact of AI-based learning media on sustainable behaviors.

## Acknowledgement

The authors would like to express their gratitude to the teachers and students of SDN. 156 Palembang for their participation and cooperation in this study. Appreciation is also extended to Universitas Sriwijaya for providing academic support throughout the research process.



 

Vol. 3, No 3: November2025
E-ISSN: 2988-7798
pp. 376-382
Email:ije@skillerindonesia.com

**References**

Hajj-Hassan, M., Chaker, R., & Cederqvist, A.-M. (2024). Environmental Education: A Systematic Review on the Use of Digital Tools for Fostering Sustainability Awareness. *Sustainability*, *16*(9), 3733. https://doi.org/10.3390/su16093733

Hassan, A., Noordin, T. A., & Sulaiman, S. (2010). The status on the level of environmental awareness in the concept of sustainable development amongst secondary school students. *Procedia - Social and Behavioral Sciences*, *2(*2), 1276–1280. https://doi.org/10.1016/j.sbspro.2010.03.187

Mariyah, Y. S., Budiman, A., Rohayani, H., & Audina, W. D. (2021). Meningkatkan Motivasi Belajar Siswa Melalui Pemanfaatan Media Audio Visual : Studi Eksperimen Dalam Pembelajaran Tari. Journal of Education, *Humaniora and Social Sciences (JEHSS)*, *4*(2), 959–967. https://doi.org/10.34007/jehss.v4i2.778

Muchlis, A. F. (2023). Metode Penelitian Survei-Kuesioner untuk Kesesakan dan Privasi pada Hunian Asrama. *Jurnal Lingkungan Binaan Indonesia*, *12*(3), 154–163. https://doi.org/10.32315/jlbi.v12i3.252

Mulya, N. (2024). Persepsi Guru Terhadap Penggunaan Canva Sebagai Media Pembelajaran Matematika. *Al-Madaris Jurnal Pendidikan dan Studi Keislaman*, *4*(2), 50–57. https://doi.org/10.47887/amd.v4i2.142

Pamungkas, W. A. D., & Koeswanti, H. D. (2022). Penggunaan Media Pembelajaran Video Terhadap Hasil Belajar Siswa Sekolah Dasar. *Jurnal Ilmiah Pendidikan Profesi Guru*, *4*(3), 346–354. https://doi.org/10.23887/jippg.v4i3.41223

Pellas, N. (2025). The Impact of AI-Generated Instructional Videos on Problem-Based Learning in Science Teacher Education. *Education Sciences*, *15*(1), 102. https://doi.org/10.3390/educsci15010102

Rini, N. W. H. N. (2022). Profil Sustainability Awareness Siswa SMA/SMK pada Materi Suhu dan Energi. *Jurnal Sains Dan Pendidikan Fisika*, *18*(1), 68–76. https://doi.org/https://doi.org/10.35580/jspf.v18i1.21535

Suprayitno, T. (2019). Pendidikan di Indonesia: belajar dari hasil PISA 2018. Project Report. Badan Penelitian dan Pengembangan. https://repositori.kemdikbud.go.id/16742/

Tilbury, D (2011) 'Education for Sustainable Development: An Expert Review of Processes and Learning' Paris: UNESCO. Available in Spanish, French and English.ED-2010/WS/46

Uslan, U., Muhsam, J., Hasyda, S., & Aiman, U. (2021). Implementation of Contextual Teaching and Learning and Authentic Assessments to the Science (IPA) Learning Outcomes of 4th Grade Students of Primary Schools (SD) in Kota Kupang. *Journal of Education Research and Evaluation*, *5*(3), 380–390. https://doi.org/10.23887/jere.v5i3.32338

Widiastika Asti, M., Hendracipta, N., & A Syachruroji, A. S. (2021). Pengembangan media pembelajaran mobile learning berbasis android pada konsep sistem peredaran darah di sekolah dasar. *Jurnal Basicedu*, *5*(1), 47–64. https://doi.org/10.31004/basicedu.v5i1.602

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education–where are the



 

Vol. 3, No 3: November2025
E-ISSN: 2988-7798
pp. 376-382
Email:ije@skillerindonesia.com

educators?. *International journal of educational technology in higher education*, *16*(1), 1-27. https://doi.org/10.1186/s41239-019-0171-0