

The role of contextually-based IPAS learning in enhancing elementary school students' environmental awareness

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ABSTRACT

The increasing environmental damage underscores the importance of environmental education from the elementary school level. This research aims to understand how contextual-based IPAS learning can increase students' environmental awareness through two main components: constructivism and modeling. A descriptive qualitative approach was used with data collection techniques including in-depth interviews with fifth-grade teachers and the school principal, as well as direct observation of student behavior in the school environment, focusing on four environmental care indicators according to the curriculum. The research findings indicate that real-life learning experiences, such as cleaning toilets, sorting trash, maintaining yard cleanliness, and caring for plants, help students develop a deeper ecological understanding. Teacher role modeling plays a significant part in shaping student behavior, as evidenced by students' tendency to imitate teachers' actions in maintaining the cleanliness of the school environment. This contextual learning practice not only helps students understand IPAS material more meaningfully but also gradually fosters an attitude of environmental care. Although some students still need encouragement and the facilities are not fully adequate, the development of environmentally conscious behavior shows a positive direction. This finding confirms that a combination of direct experience and teacher role modeling is effective in shaping ecological habits in elementary school students.

Keywords: constructivism, contextual learning, environmental awareness, elementary school, modeling

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INTRODUCTION

Environmental damage in Indonesia is getting worse, threatening life, and increasing the risk of natural disasters. This is supported by the fact in the high level threat panel & challenges and change report that environmental degradation is included as one of the ten threats to humanity (United Nations, 2004, as cited in Ramadhan et al., 2024). Environmental damage is also mentioned in the world risk report released by the German Alliance for development works as an important factor determining the level of disaster risk in a region (United Nations University Institute for Environment and Human Security & The Nature Conservancy, 2012, as cited in Ramadhan et al., 2024). Although the causes of damage are divided between natural events and human actions, the damage caused by human activities such as deforestation, land conversion, mining, and air, water, and soil pollution is considered far greater. Industrial activity is the largest contributor to

environmental pollution, which directly leads to a decrease in the environment's carrying capacity (Kristanto, 2002, as cited in Rusdiyanto, 2015). The damage caused by mining, particularly, has serious consequences, including reduced land productivity, erosion, landslides, disruption of flora and fauna, and changes in microclimate. This ongoing damage shows that human intervention exacerbates natural disasters such as floods, abrasion, and landslides.

As a crucial effort to respond to and prevent the worsening negative impacts of environmental damage, environmental education (PLH) has become a holistic system. PLH is a process to build a global human population that is aware of and cares for the total environment and all related issues, equipping them with the skills and commitment to solve problems (Krzesni, 2015, as cited in Nugroho, 2022). As a crucial effort to respond to and prevent the worsening negative impacts of environmental damage, PLH has become a holistic system. PLH is a process to build a global human population that is aware of and

cares for the total environment and all related issues, equipping them with the skills and commitment to solve problems (Harefa, 2002, as cited in Ahmad, 2010). In line with this goal, PLH is an educational program designed to cultivate students' understanding, awareness, attitudes, and responsible behavior regarding the reciprocal influence between population and the environment (Andriani & Bakhtiar, 2017, as cited in Nugroho, 2022). For effective implementation in the field, PLH needs to be supported by environmental leadership that promotes practical capacity to achieve sustainability and environmental justice (Witoelar dalam Budimanta, 2005, as cited in Ahmad, 2010). With the integration of ecological values and behaviors, it is hoped that the damage caused by human actions can be minimized.

In response to the increasingly severe environmental damage largely caused by human negligence, PLH in schools becomes very important. PLH is a program designed to cultivate students to have an understanding, awareness, attitude, and rational as well as responsible behavior regarding the reciprocal influence between the population and the environment (Pratomo, 2009, as cited in Widiawati et al., 2022). In response to the increasingly severe environmental damage largely caused by human negligence, PLH in schools is becoming very important. PLH is a program designed to develop students' understanding, awareness, attitudes, and rational, responsible behavior regarding the reciprocal influence between humans and the environment (Amini & Munandar, 2010, as cited in Widiawati et al., 2022). Therefore, the concept of PLH is aimed at sustainable conservation. The concept of PLH for students is aimed at creating knowledge, awareness, attitudes, and behaviors in individuals to have a conservation perspective that ultimately leads to an improvement in the quality of life of the students themselves (Alpusari, 2014, as cited in Widiawati et al., 2022).

PLH efforts primarily aim to raise environmental awareness, which is a person's behavior that shows an attitude change regarding environmental issues. Awareness is a change in a person's or a group's attitude, thinking, and behavior related to things occurring in their surrounding environment (Jamanti, 2014). Environmental awareness involves an individual's acknowledgment of the negative impacts of human activities and the responsibility to act sustainably for the sake of environmental sustainability (Noviyanti et al., 2017, as cited in Miterianifa & Mawarni, 2024). This attitude and behavior can be observed when humans feel free from pressure (Amos, 2008, as cited in Gabriela & Sugiarto, 2020). There are four main factors that influence a person's level of awareness, namely ignorance, poverty, humanity, and lifestyle. Increasing this awareness is very important to encourage individuals to take collective actions such as reducing energy consumption and supporting environmentally friendly practices (Gabriella & Sugiarto, 2020).

PLH in elementary schools plays a fundamental role in fostering environmental awareness because this period is a

key phase in character development, making children very receptive to positive values that help prevent environmental damage (Aisyah et al., 2024). This effort requires close collaboration between schools, the community, and stakeholders through action programs (Widyaningsih & Purwanti, 2022, as cited in Aisyah et al., 2024). This fosters awareness that encourages students to consider the implications of their behavior (Darista et al., 2015, as cited in Adzani et al., 2024). This awareness can be measured through standardized environmental care indicators for grade 1-grade 3 of elementary school, focusing on personal and immediate environmental cleanliness, including behaviors such as disposing of trash properly and not stepping on grass at school. For grade 4-grade 6, responsibilities increase, covering actions such as cleaning the WC or toilet, emptying trash bins, cleaning the school environment, and beautifying the classroom and school with plants (Ministry of National Education, Research and Development Agency, Curriculum Center, 2010). This attitude has been instilled from an early age, because a high environmental awareness is very likely to encourage someone to behave positively in ways that support the sustainability of life and actively participate in addressing the impacts of environmental damage (Adzani et al., 2024).

Environmental awareness is strongly supported by legal foundations and field practices. According to the Ministry of Environment and Forestry, the environmental awareness of the Indonesian people has generally reached a high level, as indicated by high public participation in climate change mitigation and readiness to adopt a sustainable lifestyle (Aisyah et al., 2024). In elementary school students, it has been proven that students' environmentally caring character is formed from an early age, so students have a high awareness of taking care of the environment, and students become accustomed to disposing of and sorting waste according to its type (Riambodo & Kurniawati, 2023). According to the data, the average environmental awareness score of 4A class students reached 86.74, falling into the good category, with a dominant percentage of 73.7% in the good range (Aisyah et al., 2024). This awareness is mandated by Article 28H of the 1945 constitution and law no. 32 of 2009 on environmental protection and management, which requires efforts for environmental preservation. Systematic implementation in schools is facilitated by the Adiwiyata School program policy and the PBLHS movement, which are regulated in the Ministry of Environment and Forestry regulation no. P.52/MENLHK/SETJEN/KUM.1/9/2019.

Although environmental awareness has started to improve, the problems in the field are still significant and need further research. Many people are still not concerned about the negative impact of their behavior on the environment and do not know much about sustainable solutions (Farihin, 2023). This issue is very urgent, as low environmental awareness is one of the causes of flooding (Jamanti, 2014). This gap is also seen in elementary schools, where fifth-grade students' environmental awareness is still relatively low due to a lack of knowledge (Siskayanti &

Chastanti, 2022). This is supported by a study conducted by Putri (2025) which found that the environmental concern of elementary school students is still relatively low, as seen from students' attitudes of not paying attention to a dirty classroom and the large amount of scattered trash. The habit of littering is a small action with a big impact because it can block waterways and cause flooding. Mass media can be a very effective tool to spread messages and encourage everyone to work together to solve the flooding problem.

One effective approach in increasing environmental awareness is the contextual teaching and learning (CTL) model. This contextual learning model allows students to learn through direct experiences with their surrounding environment, making the learning material more meaningful and applicable (Immaniar et al., 2019, as cited in Iduard et al., 2025). This contextual learning model allows students to learn through direct experiences with their surrounding environment, making the learning material more meaningful and applicable. In addition, contextual learning encourages active student engagement in the learning process and enhances the ability to think critically and reflectively about environmental issues (Syaifuddin et al., 2021). CTL generally encourages students to be fully engaged in the teaching process and helps them apply the material to their routines (Marzuki, 2020, as cited in Apriyanti et al., 2025). Through CTL, students are encouraged to make their own discoveries about main ideas and use what they have learned in practical contexts (Linda & Lestari, 2019, as cited in Apriyanti et al., 2025). The contextual approach has seven main essential components, namely: constructivism, questioning, inquiry, learning community, modeling, reflection, and authentic assessment (Sihono, 2004).

Contextual learning models (CTL) are often used, but our research has a unique focus. Putri's (2025) research focuses on CTL that is tied to specific media, namely plastic waste, while our research limits implementation to only two core components of CTL. The research conducted by Zharfana and Nugroho (2024) focuses on the Inquiry component and learning communities through river exploration activities. Our research specifically examines how direct experience (constructivism) combined with real-life examples (modeling) can bring about behavioral change, ignoring other CTL components. Regarding measurement indicators, the studies by Rahmawati and Saputra (2024) and Mustikawati et al. (2023) used common indicators. Unlike both of these studies, our research uses highly specific indicators based on the theories of John Dewey and Johnson to precisely measure the implementation of these two selected components in high school students. This difference makes the measurement of variable X in our study much more accurate and structured.

The study conducted by Fatmala et al. (2017) focused on awareness variables measured through scientific attitudes and scientific literacy, whose indicators emphasized cognitive abilities, such as formulating scientific problems. Meanwhile, our study has a variable Y (students'

environmental awareness), whose indicators predominantly focus on the behavioral (conative) dimension, namely concrete actions and physical responsibility in the school environment (cleaning toilets, cleaning trash bins, cleaning the school environment, and beautifying classrooms and schools with plants). Putri's (2025) research focuses on Islamic environmental cleanliness values, which use the dimension of religious responsibility as part of environmental awareness. Meanwhile, our research has a variable Y (student environmental awareness) that does not include the religious dimension but focuses on purely secular (general) behavioral (conative) responsibility that is highly operational in the school environment. The research by Zharfana and Nugroho (2024) variable Y (environmental awareness) focuses on understanding ecosystems and protecting the environment outside of school, for example, through river tracing activities. Meanwhile, our research has a very specific variable Y (students' environmental awareness) that focuses on the internal school environment and the responsibility for maintaining vital facilities that are often overlooked, as indicated by the following indicators: cleaning toilets and cleaning trash bins.

Environmental awareness has become a life skill that every student must have from an early age, especially amid the increasingly noticeable impacts of climate change and damage. Schools play a crucial role as the first place for children to learn how to care for the earth. However, in reality, many students still view environmental issues as concepts that are far removed from their daily lives, even though they know the definitions. This is where our research comes into, as contextual learning (CTL) offers a way of learning that is closer to the real world of students. Through CTL, students can observe the environment, solve real problems, and even interpret simple experiences such as keeping the classroom clean. This research is important to see the extent to which a contextual approach can help elementary school students build a more personal relationship with the environment. Ultimately, this is expected to shape a generation that is more aware, sensitive, and responsible for the earth they live on.

Recognizing the importance of a contextual approach to bridging students' knowledge and real-world action, the purpose of this study is to understand how contextual-based learning can increase students' environmental awareness through learning experiences that are in line with the principles of constructivism, where students learn through direct experience (learning by doing) as proposed by John Dewey. The process involves students being invited to participate actively in activities such as cleaning toilets, maintaining trash bins, keeping the school environment clean, and beautifying classrooms and yards with plants, so that these activities become a lively and meaningful learning space. This study also aims to examine how questioning skills help students understand the reasons behind each environmental action, while exploring Johnson's modeling process, in which students re-practice the behaviors or activities exemplified by teachers to reinforce positive habits in themselves. Through a combination of direct

experience, reflective activities, and real examples from teachers, this study seeks to describe how a contextual approach can shape attitudes of responsibility and environmental awareness in elementary school students.

LITERATURE REVIEW

The increasingly widespread environmental damage serves as a reminder that education plays a crucial role in preparing for a generation that cares about the earth. Various international reports, such as the UN high-level threat panel and the world risk report (Ramadhan et al., 2024) affirming that environmental degradation is a serious threat to humanity. Kristanto (2002, as cited in Rusdiyanto, 2015) even emphasized that industrial activity is the main cause of declining environmental quality. This condition indicates that environmental problems require not only technical solutions but also early changes in human behavior. Therefore, PLH is presented as a strategic step to cultivate awareness and responsibility. Krzesni (2015, as cited in Nugroho, 2022) interpreting PLH as a process of building environmentally conscious and caring individuals, while Andriani & Bakhtiar (2017, as cited in Nugroho, 2022) emphasizing that PLH must shape responsible understanding, attitudes, and behavior. In line with this, Harefa (2002, as cited in Ahmad, 2010) stating that learning ideally helps learners develop intellectual capacity to understand life changes.

Elementary school is an important place to instill these values, as this is the period when a child's character develops rapidly. Pratomo (2009, as cited in Widiawati et al., 2022) emphasizing that PLH must foster students' responsibility toward their surrounding environment. However, research indicates that students' environmental awareness is still relatively low, as evidenced by their lack of interest, habit of littering, or lack of concern for classroom cleanliness (Erdoğan & Uşak, 2009; Siskayanti & Chastanti, 2022; Putri 2025). In fact, environmental awareness is defined as a change in attitude, thinking, and behavior toward environmental issues, and involves individual awareness of the impact of human activities and the responsibility to act sustainably (Jamanti, 2014; Noviyanti et al., 2017, as cited in Miterianifa & Mawarni, 2024).

In the realm of learning, the CTL model has become an approach that helps students understand their environment through real-life experiences. According to Immaniar et al. (2019, as cited in Iduard et al., 2025), CTL makes learning more meaningful because students learn directly from their environment. Syaifuddin et al. (2021) also emphasizes that CTL enhances critical and reflective thinking abilities. Furthermore, Linda and Lestari (2019, as cited in Apriyanti et al., 2025) explain that CTL includes seven important components: constructivism, questioning, inquiry, learning community, modeling, reflection, and authentic assessment. Previous research has incorporated various CTL components, but this study specifically focuses on the constructivism and modeling components, referencing

John Dewey's ideas on learning by doing and Johnson's emphasis on the importance of behavioral examples. The environmental awareness indicators used are also very concrete, such as cleaning toilets, maintaining trash cans, and beautifying the classroom. This ensures that students learn not only through theoretical knowledge, but also through direct physical action, experience, and real-life examples (Erdoğan et al., 2011). With this approach, learning is expected to foster a more vibrant, relatable, and meaningful environmental awareness among elementary school students.

METHODOLOGY

Research Design

This research describes how teachers implement contextual IPAS learning by combining constructivist and modeling approaches to increase students' environmental awareness. The method used in this research is a qualitative method. According to Aspers and Corte (2019) qualitative research is an iterative process where the researcher attempts to get close to the phenomenon being studied directly. Through this process, a new understanding is formed based on the researcher's proximity to the research context. According to Denzin and Lincoln (2011) qualitative research is conducted in a natural setting, and the researcher is directly present in the environment of the phenomenon. The main goal is to understand the subjective meaning constructed by individuals or groups (Kelemen et al., 2025).

Participants

The key participants in this qualitative study are one 5th grade teacher and the principal from SDN Walantaka 3. These two informants were selected using purposive sampling, as defined by Palinkas et al. (2015) as a strategy for selecting information-rich cases to achieve a deep understanding of specific phenomena. This technique is very suitable because this research focuses on the role of teachers, as the direct implementers of contextual-based IPAS learning, and the principal, as the policymaker and supervisor in the school. Therefore, these participants were purposefully selected because they possess unique knowledge and experience most relevant to answering questions about how contextual IPAS learning is implemented and influences students' environmental awareness (Etikan et al., 2016).

Data Collection

Data collection techniques in this research were carried out through observation and interviews. Observation was conducted in the classroom during IPAS learning to see how the teacher related the material to environmentally caring behaviors such as disposing of waste in its place and taking care of plants, as well as demonstrating cleanliness actions that are easy for students to imitate. In addition, observation was also carried out outside the classroom

focusing on students' activities in carrying out class duties, cleaning the surrounding environment, and using school facilities that support environmentally caring behavior and routine activities such as SHBS (every day free of waste) involving the entire school community. In addition, the researcher also observed the role of the teacher, the principal, and school staff in maintaining environmental awareness, including their involvement in cleaning toilets and trash bins as a form of real modeling for students. Interviews were conducted with the fifth-grade teacher to explore their strategies and experiences in implementing contextual-based IPAS learning, as well as with the principal to obtain information regarding school policies and programs that support environmentally caring behavior in accordance with the indicators from the Research and Development Agency of the Curriculum Center. The combination of these two techniques provides a comprehensive picture of the implementation of environmental care in schools, both through the real behavior of students and through the exemplary behavior of teachers and school support.

Analysis of Data

Data analysis in this study was carried out using the interactive model developed by Miles and Huberman (1994), which focuses on three main interrelated components. These components include data reduction, data presentation, and conclusion drawing/verification. The data reduction stage is carried out by selecting, sorting, and focusing on important data sourced from in-depth interview transcripts with the fifth-grade teacher and the principal, as well as relevant observation and documentation data. The simplified data are then transferred to the data presentation stage, where the information is arranged systematically in the form of narratives or matrices to facilitate the identification of patterns, relationships, and key findings. The final process is conclusion drawing and verification, namely drawing temporary conclusions that are then tested and re-examined repeatedly, especially by referring to the statements from the teacher and the principal, to ensure that the final conclusions produced have a high level of validity and credibility.

Data Validity

The validity of qualitative data in this study was established through the trustworthiness framework developed by Lincoln and Guba (1985, as cited in Korstjens & Moser, 2018), as a substitute for the concepts of validity and reliability in quantitative research. Trustworthiness is built through four main criteria: credibility, which ensures that the findings are accurate and aligned with participants' perspectives; dependability, which ensures the consistency and auditability of the research process; transferability, which allows the reader to assess the extent to which the findings can be applied to other contexts; and confirmability, which ensures that the findings are based on field data and not researcher bias. The application of these

criteria, such as the use of triangulation and an audit trail, is carried out to ensure that the data produced is truly accurate, consistent, and accountable.

FINDINGS/RESULTS

The Role of CTL in Constructivism (Learning by Doing) on Elementary School Students' Environmental Awareness

An indicator of a clean toilet

Based on interviews with teachers and principals as well as direct observations in the school environment, contextual-based IPAS learning in elementary schools has been proven to encourage students to learn through real experiences. Students not only listen to explanations about the importance of maintaining environmental cleanliness but are also invited to practice it in their daily activities at school. With a constructivist approach, students build their understanding through direct experience, involvement in various activities, and interaction with the surrounding environment. An attitude of caring for the environment then begins to be seen in various behavioral indicators demonstrated by students. The first indicator was seen in the activity of cleaning toilets. Teachers linked the condition of school toilets to IPAS material so that students could see and understand real problems in their learning environment. Based on the results of observations, students appeared to learn about the importance of toilet hygiene through direct activities such as scrubbing the floor and cleaning slippery areas.

Figure 1 shows that the students are cleaning the public toilets at school.

Teachers and principals also explained that although some students were initially reluctant, regular practical activities gradually helped them get used to the new routine and start participating more enthusiastically. It is through this experience-based learning process that students develop an understanding of sanitation, although continued practice is still needed, given that toilet facilities are not yet fully adequate.

An indicator of cleaning the trash bin

The second indicator showing the growth of environmental awareness among students is the activity of cleaning up trash. From the interview results, the teacher explained that he integrated the concepts of organic and inorganic waste into the lesson, then invited students to directly observe the condition of trash bins around the classroom. The results of the observation showed that students became more aware of disposing of waste in its proper place and cleaning up trash bins by throwing the waste into larger trash bins so that it would not pile up and cause discomfort to the people around them. **Figure 2** shows that the students are cleaning the trash cans and throwing trash in the designated places.



Figure 1. Students are cleaning the public toilets at school (the authors' own documentation)



Figure 2. Students are cleaning the trash cans and throwing trash in the designated places (the authors' own documentation)

Some students also began to remind each other when their friends were still negligent. This understanding grew not only from the theory taught in class, but also from the real experiences they had every day. However, waste management at the final stage, such as more systematic sorting and recycling activities, still needs to be improved so that students' understanding can develop more comprehensively.

An indicator of cleaning the school environment

Based on interviews with senior teachers and the principal, it was revealed that there is harmony between the implementation of IPAS learning and efforts to instill environmental awareness through school cleaning activities. Teachers stated that they often relate material, such as ecosystems, to real cleaning activities, with the aim of helping students understand the concepts directly. This indicator of developing environmental awareness is

reinforced by the students' routine of cleaning before class, which provides them with a direct learning opportunity to maintain school cleanliness. The results of these interviews are supported by the researcher's observations, which show that linking IPAS with the practice of maintaining the school environment directly involves students. Observations show that these activities include participating in cleaning classrooms, school yards, school gardens, weeding, and conducting ant operations. **Figure 3** shows that the students are cleaning the school environment together.

Students have proven themselves capable of applying the concepts learned in class to everyday practice, such as picking up trash during breaks. This direct experience has successfully raised awareness of the importance of the school environment in the learning process. However, consistent support from all teachers still needs to be strengthened so that environmentally conscious behavior can develop evenly among all students.



Figure 3. Students are cleaning the school environment together (the authors' own documentation)



Figure 4. Students are caring for and planting plants in the school garden together (the authors' own documentation)

An indicator of beautifying and maintaining plants in the classroom and school environment

Based on interviews with senior teachers and the principal, it is evident that there is active contribution to raising environmental awareness through activities such as beautifying and maintaining plants. Teachers stated that they involve students in taking turns watering and cleaning the pots in front of the classroom, especially when discussing IPAS material about living things. Indicators supporting the formation of environmental awareness are seen through activities such as watering plants, arranging pots, and caring for plants in the school environment, which help students build an understanding that plants play an important role in creating a comfortable and healthy classroom atmosphere. Strong support came from the school leadership through participation in the "Serang Hijau" (Green Serang) program, which provided seedlings and facilities, making the school environment greener and serving as a learning medium. The results of these interviews were supported by the researcher's observations, in which students appeared enthusiastic and scrambled for watering tools, showing their excitement in caring for plants, which extended to the land provided by the school. **Figure 4** shows that the students are caring for and planting plants in the school garden together.

This hands-on experience makes students more appreciative of the environment around them, and the "Green Serang" program enriches the learning experience as students interact directly with the plants they care for,

supported by the collective contributions of teachers and staff. The hope is that this understanding and these habits will not only be applied at school but will also become sustainable behaviors in students' daily lives.

The Role of CTL in Modeling (Re-Practicing Exemplified Activities) on Elementary School Students' Environmental Awareness Indicators

An indicator of a clean toilet

Based on interviews and observations in elementary schools, teachers play an important role as models in contextual IPAS learning. Teachers not only explain the concepts of cleanliness and environmental sustainability, but also demonstrate practical examples, with a focus on cleaning toilets. Teachers begin modeling by explaining detailed steps such as scrubbing the floor, disposing of trash, flushing dirty areas, and reminding students to use tools, accompanied by scientific and health reasons, such as preventing slippery floors or mosquito larvae. Although the teacher acknowledged that the students were initially insensitive and reluctant, and had to be commanded and persuaded, this modeling was considered very influential because the teacher was a role model. The results of these interviews were supported by the results of observations conducted by the researcher, in which the teacher was observed giving direct examples. **Figure 5** shows that the teacher is demonstrating how to clean the toilet.

After being shown how to do it, the students responded positively by dividing up the tasks of scrubbing, fetching



Figure 5. The teacher is demonstrating how to clean the toilet (the authors' own documentation)



Figure 6. The teacher is demonstrating how to throw away the trash in front of the classroom into the trash bin (the authors' own documentation)

water, and watering, demonstrating that they were able to replicate the activities they had been shown. The collective involvement of teachers and school staff in hygiene activities was also observed and served as a modeling support to motivate students. However, these efforts were hampered by limited toilet facilities, with only two female toilets and one enclosed toilet for males available, which was considered inadequate for the total number of students.

An indicator of cleaning the trash bin

Based on interviews and observations at elementary schools, the role of teachers as role models has proven to be very important in fostering environmental awareness, especially in cleaning up trash, because students are more likely to imitate concrete actions. This exemplary behavior is demonstrated when teachers show students how to dispose of and sort trash properly, while occasionally giving advice on keeping the school environment free of trash and taking responsibility for their own trash. **Figure 6** shows that the teacher is demonstrating how to throw away the trash in front of the classroom into the trash bin.



Figure 7. Teachers are sweeping the yard and cleaning the school environment during the SHBS activity (the authors' own documentation)

Observations confirm that teachers also routinely remind students to clean trash cans and dispose of trash in larger bins, rather than letting it pile up and cause discomfort. This consistent modeling is supported by the principal through the implementation of a routine teacher-student duty schedule and a daily trash-free program every morning. Overall, this indicator shows considerable progress, with students beginning to emulate these habits and even reminding their peers who are not disciplined, especially during class duty. Additionally, the school plans to establish a waste bank as an additional learning platform to enhance students' responsibility toward waste management.

An indicator of cleaning the school environment

Teachers say that elementary school students are generally not very sensitive to environmental issues, but teachers try to instill a sense of environmental awareness in them. This requires adults to demonstrate environmental awareness and care for the environment. Actions start with simple things such as picking up trash, sweeping, and consistently cleaning school grounds and gardens. **Figure 7** shows that the teachers are sweeping the yard and cleaning the school environment during the SHBS activity.

So students can see and imitate what the teacher does, but it must be preceded by instructions and encouragement from the teacher first. The school also supports this with a regular SHBS program every morning and a WAMUJAR (parent teaching) program that involves parents. During an interview on October 16, 2025, the principal said:

(Indonesia translated) "Our school involves parents or guardians through the WAMUJAR (Parents Teach) program, which aims to enable students to learn directly from their parents or guardians about the importance of maintaining cleanliness, not just from teachers. I also hope that students can apply this attitude of caring for the environment at home."

Based on the researcher's observations, modeling proved to be effective because teachers were seen sweeping the yard and garden, and students showed



Figure 8. Students and teachers are cleaning the school environment together (the authors' own documentation)



Figure 9. The teacher is demonstrating to the students how to care for plants (the authors' own documentation)

obedience and enthusiasm in carrying out the teachers' instructions during the joint cleaning, helping to clean the yard and garden around the school. **Figure 8** shows that the students and teachers are cleaning the school environment together.

An indicator of beautifying and maintaining plants in the classroom and school environment

Teachers play a vital role in fostering students' concern for plants, especially by setting an example (modeling). Teachers do not merely give instructions, but show students how to water plants, clean leaves, and arrange pots in front of the classroom before class starts. This proactive attitude on the part of teachers sparks students' curiosity to ask why they should do these things, which ultimately motivates them to help. **Figure 9** shows that the teacher is demonstrating to the students how to care for plants.

The principal acknowledged that there were challenges in maintaining the students' enthusiasm over time, so he emphasized that teachers must continue to set an example. However, the principal hoped that these positive habits would carry over to the students' homes and become part of their character. Based on the researcher's observations, this modeling was clearly successful because the students followed the teachers' actions enthusiastically, often doing

so without being asked, and taking care of the plants according to schedule. The students appear to be very enthusiastic, especially when watering the plants in the school garden. Teachers are also actively involved in caring for the plants, such as cutting off wilted parts, with the help of students. This is supported by the "Serang Hijau" (Green Serang) program and a rotating schedule for all classes to water and measure the plants in the school garden, which overall makes learning about caring for the environment livelier and more meaningful.

DISCUSSION

The Role of CTL in the Constructivism Aspect (Learning by Doing) on Elementary School Students' Environmental Awareness

An indicator of cleaning the toilet

The results of interviews and observations show that the implementation of CTL in elementary schools has been proven to encourage students to take real actions in the form of the indicator of cleaning the toilet, which is strongly supported by the constructivist framework. revealed that a constructivist learning environment that encourages active involvement can increase students' motivation and learning

strategies. Thus, directly cleaning the toilet, starting from scrubbing the floor to removing slippery parts, is a real example of learning by doing that effectively connects IPAS material about sanitation with relevant contextual situations in schools (Welerubun et al., 2022). Through this physical involvement, students actively construct a deep understanding of the importance of cleanliness and responsibility, not merely a transfer of information (Safri et al., 2024). This direct experience successfully transformed the initial reluctance into enthusiastic participation and formed affective behavior in the form of independently maintaining toilet cleanliness. Therefore, the activity of cleaning the toilet functions as a valid practical laboratory, in which this routine habituation significantly contributes to the internalization of sustainability values and the improvement of environmental awareness (Safri et al., 2024).

An indicator of cleaning the trash bin

The indicator of activities cleaning the trash bin strongly shows the success of the implementation of CTL based on constructivism in fostering students' environmental awareness. The direct involvement of students in disposing, cleaning, and moving trash to a larger disposal area is a real practice of learning by doing that effectively connects IPAS material about sanitation with contextual situations in the school environment (Welerubun et al., 2022). This practical action encourages students to actively construct an understanding of waste management and the 3R concept (reduce-reuse-recycle), which goes beyond theoretical understanding (Safri et al., 2024; Tsang et al., 2025). Activities of maintaining the cleanliness of the trash bin and reminding friends who are negligent are evidence of the transition of knowledge into real behavior change. This routine practice functions as part of an outdoor study, which is crucial in improving ecoliteracy and internalizing environmental responsibility values (Cañón-Vargas et al., 2025).

An indicator of cleaning the school environment

The indicator of the development of environmental awareness in students, which is manifested in the routine of cleaning the classroom, the school yard, the garden, and even taking care of plants, proves the existence of a strong alignment between the implementation of IPAS learning and the CTL approach based on constructivism. This activity is in line with the principle of outdoor learning or learnscape, where the school becomes a learning space that brings students closer to nature. Constructivism emphasizes that learning occurs through direct action and real interaction, so that connecting IPAS material (ecosystems) with cleanliness and environmental maintenance practices facilitates direct understanding of concepts through teamwork and real projects (Nurbaeti et al., 2020). Studies confirm that school garden and greening projects (including taking care of plants and beautifying the classroom) are contextual practices that successfully improve ecological awareness (ecoliteracy), scientific skills, and students'

understanding of life values (Aragón & Manzano, 2025). Through activities of maintaining the school yard and teamwork, students see a direct relationship between their actions and the aesthetic and environmental health outcomes of the school, thereby fostering a deep sense of care (Kelemen et al., 2025). Students are proven to be able to apply the concepts learned to daily practices such as picking up trash during break time, however, the consistency of support from all teachers still needs to be strengthened so that the development of environmentally caring behavior can be formed evenly.

An indicator of beautifying and maintaining plants in the classroom and in the school environment

Sustainable maintenance is the most profound aspect of contextual learning is sustainability not only doing it once but building long-term habits and responsibility. The effectiveness of the active constructivism approach in PLH finds a large effect on environmental learning outcomes meaning that real experiential interventions (projects, problem-based, outdoor) are effective in increasing students' environmental awareness and ecological practices (Arik & Yilmaz, 2020). By involving students in the continuous maintenance of the school garden or green spaces, they learn to care for the environment, observe plant growth, manage organic waste, and take responsibility for shared spaces. Research on school gardens and schools as ecological spaces shows that garden-based learning supports the development of sustainable environmental awareness, a sense of belonging to nature, and ecological skills. One effective way to apply a constructivist approach in PLH is through "garden-based learning" or garden-based/green school learning. This was demonstrated in a study conducted by Cañón-Vargas et al. (2025) Learning through the school garden or green school spaces allows students to experience a direct connection between humans, nature, and internalize ecological values through practical activities. In alignment with this, Turner-Hill et al. (2021) clarified that school gardens serve as an effective living laboratory to engage students in sustainable caretaking activities and ecological practices, directly instilling deep environmental awareness and a long-term sense of responsibility.

The Role of CTL in the Modeling Aspect (Re-Practicing Activities That Have Been Demonstrated) Toward Elementary Students' Environmental Awareness Indicator

An indicator of cleaning the toilet

The role of the teacher as a role model in CTL has been proven effective in increasing elementary students' environmental awareness, especially in the indicator of cleaning the WC/toilet. According to Bandura (1971), student learn through observation, reproduction, and motivation; therefore, consistent sanitation demonstrations by teachers are the key. This is supported by empirical studies which found that positive demonstrations by teachers contribute to an increase in

children's pro-environmental behavior (Liang et al., 2022). Teachers not only explain the concept but also model toilet cleaning practices in detail, accompanied by explanations of health and scientific reasons. Therefore, toilet-cleaning activities serve as a valid practical laboratory, where this routine habituation significantly contributes to the internalization of sustainability values and the improvement of environmental awareness (Safri et al., 2024). Observations show that although the students were initially less responsive, they responded positively by collaboratively practicing the activities that were demonstrated. In addition, the behavior of teachers and school staff also influences children's hygiene practices, as noted in global studies on determinants of handwashing behavior in schools. However, this strong modeling effort is constrained by the limited school toilet facilities, which are not proportional to the number of students.

An indicator of cleaning trash bins

The role of the teacher as a role model has proven crucial in fostering environmental awareness among elementary school students, particularly in the indicator of cleaning trash bins and waste sorting. When teachers actively model waste sorting and proper disposal, students gain vicarious learning that encourages similar actions. Observations and interviews show that teachers routinely demonstrate how to dispose of and sort waste, supported by school policies such as duty schedules and the SHBS program. This consistency leads students to begin imitating these habits, even reminding their peers. The alignment between teacher behavior and student behavior has also been emphasized in literature studies (Zhao et al., 2024). Integration of waste management practices into the curriculum, such as composting, has been proven to improve students' literacy and behavior (Muniz et al., 2025). Efektivitas permodelan ini juga diperkuat oleh temuan studi tinjauan yang menunjukkan bahwa intervensi *modeling* oleh figur otoritas, seperti guru, mampu memicu perubahan signifikan pada perilaku pro-lingkungan anak di sekolah (Liu & Green, 2024). Empirically, the significant positive correlation between teachers' pro-environmental behaviors and students' environmental practices has also been highlighted in recent literature (Zhao et al., 2024).

An indicator of cleaning the school environment

Teacher modeling that is directly involved in collective cleaning activities provides a strong social signal about the value of protecting the environment, which encourages students' collective ownership and responsibility. Observational learning emphasizes that actions that are visible and routinely practiced will tend to be imitated by children (Fryling et al., 2011). Due to the low level of sensitivity among elementary school students, teachers need to consistently model these simple actions, which should also be supported by school programs involving parents. Evidence from PLH studies shows that teacher-led outdoor learning facilitates the development of environmental caring attitudes and active student

participation (Duda, 2022). This is reinforced by the study of Sajidan et al. (2022), which shows that the implementation of the outdoor learning model can foster students' environmental care attitude.

An indicator of beautifying and maintaining plants in the classroom and school environment

Modeling by teachers who actively care for plants, arrange the classroom with plants, and routinely maintain the school garden instills a sense of ownership and long-term engagement in students. Evidence from school-garden research shows that teacher involvement in gardening activities correlates with an increase in environmental literacy and pro-environmental behavior in students (Kelemen et al., 2025). Theoretically, Bandura's (1971) social cognitive theory explains that observing a consistent model who receives social reinforcement motivates children to reproduce behavior. Teachers who actively model plant care not only give instructions, but directly show how to water and clean, helping to transform greening activities into school habits and values. This is also supported by research by Cañón-Vargas et al. (2025) which shows a positive effect on changes in student behavior when teachers actively facilitate and model gardening activities. The teacher's proactive attitude triggers students' curiosity and encourages them to help, although the principal acknowledges challenges in maintaining consistent enthusiasm. Based on observation, this modeling has clearly been successful because students enthusiastically follow the teacher's actions, even often doing so without being asked, supported by the "Serang Hijau" program and a rotating duty schedule.

CONCLUSION

Contextual IPAS learning in elementary schools has been proven to contribute to fostering environmental awareness among students, as they not only understand concepts through teachers' explanations, but also learn directly through real activities at school such as maintaining toilet hygiene, managing waste, cleaning the school environment, and caring for plants. Teachers' exemplary behavior through direct actions is an important factor in encouraging students to imitate positive behavior, supported by school programs such as SHBS and cleanliness activities that reinforce habits. Although there are still limitations in facilities and uneven levels of student awareness, the development of students' environmental awareness shows steady improvement over time. The conclusions per indicator are as follows:

1. **Cleaning toilets:** Students have begun to participate in maintaining toilet cleanliness through guidance and exemplary behavior from teachers, although facilities still need to be improved.
2. **Cleaning trash bins:** Routine cleaning activities and consistent habit formation encourage students to be

more responsible in disposing of trash in its proper place.

3. **Cleaning the school environment:** Teachers' example and supportive facilities foster students' initiative in maintaining the cleanliness of the school grounds and areas.
4. **Beautifying and maintaining plants:** Direct involvement in caring for plants makes students more concerned about the comfort and beauty of the school environment.

Recommendations

Based on the findings of this study, future researchers are advised to expand the scope of their research by involving more schools and participants, so that a more comprehensive picture of the effectiveness of contextual-based IPAS learning can be obtained. Future studies can also combine qualitative methods with quantitative instruments to measure changes in student behavior more objectively and measurably. In addition, because this study focused on two components of CTL, namely constructivism and modeling, future researchers can explore other CTL components such as inquiry, learning community, and authentic assessment to see the contribution of each component to environmental awareness. The development of more structured contextual learning programs or modules is also important to be tested so that they can be used more widely by teachers. Long-term studies are also recommended to observe the sustainability of students' environmentally conscious behavior outside the research context. Finally, further research could involve parents and the community around the school and consider the use of technology or digital media to strengthen environmental learning that is more interesting and relevant to students.

Limitations

During the research process, researchers encountered several obstacles related to time constraints. The principal and fifth-grade teachers had to adjust the interview schedule to fit the school's busy agenda, resulting in several postponements. In addition, during the observation, teachers had to continue teaching, so researchers were unable to freely explore information in depth. These conditions meant that the data collection process took longer than originally planned. In conducting the research, the researcher faced several obstacles, particularly related to coordinating schedules with the principal and teachers, who had busy school schedules. During the interviews, there were several delays because the principal had to attend internal meetings and the teachers had to complete their teaching tasks first. In addition, when conducting observations, the researcher had to wait for the IPAS learning activities to take place so that the data obtained would be accurate and relevant to the research needs.

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