



Environmental Literacy Among Elementary Learners: Awareness, Attitudes & Practices

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Abstract

Environmental education in the contemporary world should be seen not as an optional aspect of schooling but as an essential one. Due to the ongoing processes of global warming and resources' depletion, it becomes extremely crucial for schoolchildren to comprehend what is happening around them, because their further development will depend largely on the understanding of the current state of the planet and willingness to contribute to improving it. This study focuses on children's knowledge regarding the issue, attitudes towards it, and the measures they can undertake to promote a positive change. In total, 120 participants have been selected to answer questionnaires and discuss environmental issues. It turned out that young people are quite aware of the matter and are willing to do everything necessary for changing their situation; however, implementing ideas in practice is rather difficult. Findings reveal the need for including more practical activities, developing a relevant curriculum, and encouraging teachers to promote the discussed ideas beyond classroom discussions.

Learning about environment has been made one of the crucial objectives of education due to growing global threats like global warming, climate change, depletion of resources, and ecological imbalance. Students at the elementary level need to develop greater awareness of environment threats and proper education needs to be imparted. Early-stage delivery of knowledge is essential. This research is aimed to find out the degree of environmental literacy of elementary level learners. It has been done through the assessment of environmental literacy along three major parameters, which include awareness, attitude, and practice. This study uses a descriptive survey method of research in a mixed-method format. Information was gathered through questionnaires and interview methods from 120 students of elementary classes and their teacher. Research results show that they have moderate environmental awareness as well as positive attitude towards conserving environment. However, there is some sort of gap between their environmental awareness and practice. The findings contribute to the growing discourse on environmental education and provide practical implications for educators, curriculum developers, and policymakers.

Keywords: Environmental Literacy; Elementary Education; Environmental Awareness; Environmental Attitudes; Environmental Practices; Sustainability Education

Introduction

The environmental issues have now become a critical global problem affecting ecosystems, human health, and economic sustainability. Rapid industrial growth, urbanization, and unsustainable

consumption patterns have increased environmental degradation, leading to climate change, global warming, biodiversity loss, and pollution. The challenges that were found can only be mitigated if there is change in human behaviour and attitude towards environment, rather than only using technological and policy solutions to protect environment.

The fundamental role of Education is to foster this transformation. Education related to environment, particularly at the elementary level, serves as a foundation for developing students with environment friendly responsibility. At this stage, children are highly receptive to new ideas and values, making it an ideal period for instilling environmental awareness and sustainable practices. Environmental literacy is a multidisciplinary concept that combines knowledge, attitudes, skills, and behaviors related to environmental issues. Thus, environmental literacy is not limited to cognitive understanding but also includes affective and behavioral components. Although environmental education is introduced in school curriculum but a gap is created between the student's knowledge they acquire and their behaviour towards environment when seen practically. This discrepancy is commonly referred to as the “knowledge-action gap.”

The present study aims to explore environmental literacy among elementary learners by examining three key components: awareness, attitudes, and practices. By analyzing the relationships among these components, the study seeks to identify gaps and suggest strategies for improving environmental education at the foundational level.

Environmental issues have emerged as some of the most pressing global challenges of the 21st century, significantly affecting ecosystems, human health, and long-term economic sustainability. Phenomena such as climate change, deforestation, biodiversity loss, air and water pollution, and the depletion of natural resources are no longer distant concerns but immediate realities impacting both developed and developing nations. Education is widely recognized as a powerful tool for fostering such transformation. Environmental awareness is very necessary in all levels of education to engage individuals in environment friendly worship and spread knowledge among them. It aims not only to increase awareness about environmental problems but also to develop critical thinking, problem-solving abilities, and a sense of stewardship toward the natural world. Among the various stages of education, the elementary level is especially significant. Early childhood and primary education represent formative periods during which children are highly receptive to new ideas, values, and habits. At this stage, learners begin to develop their worldview, making it an ideal time to introduce concepts related to environmental protection and sustainability. Environmental literacy nowadays has become as a key concept stating how individuals interact with their environment and use sustainable measures to protect it. It is a multidimensional construct that encompasses cognitive, affective, and behavioral components. The cognitive dimension involves knowledge and understanding of environmental systems, issues, and processes. The affective dimension includes attitudes, values, and emotional connections to the environment, while the behavioral dimension relates to the actions and practices individuals adopt in their daily lives. According to Roth (1992), an environmentally literate individual is not only knowledgeable about environmental systems but also demonstrates concern for environmental issues and actively participates in efforts to address them. This definition highlights the holistic nature of environmental literacy, emphasizing that true literacy extends beyond awareness to include a commitment to action.

Numerous studies have documented that while students often possess a basic understanding of

environmental issues and express positive attitudes toward environmental protection, these do not consistently translate into responsible environmental practices. For instance, students may acknowledge the importance of conserving water, reducing waste, or protecting biodiversity, yet fail to incorporate these principles into their everyday actions. This discrepancy, commonly referred to as the “knowledge-action gap,” represents a major challenge in the field of environmental education. One possible explanation lies in the way environmental education is delivered in schools. In many cases, it remains largely theoretical and exam-oriented, focusing on the transmission of information rather than experiential learning or practical application. As a result, students may acquire factual knowledge without developing the skills or motivation needed to act upon it. Additionally, the lack of opportunities for hands-on activities, such as participation in environmental projects, community initiatives, or outdoor learning experiences, can limit students’ ability to connect abstract concepts with real-world situations. This requires the use of innovative teaching strategies, including inquiry-based learning, project-based activities, and collaborative problem-solving, as well as the integration of environmental themes across different subjects. The present study seeks to contribute to this ongoing discourse by exploring environmental literacy among elementary learners, with a specific focus on three key components: awareness, attitudes, and practices. Awareness refers to students’ knowledge and understanding of environmental issues, attitudes encompass their feelings and values toward the environment, and practices involve the actions they take in their daily lives. After going through the components, it is clear that environmental awareness and literacy at the foundation level are very much essential. Moreover, the study seeks to identify potential gaps between students’ awareness and their actual practices, thereby stressing on the extent of the knowledge-action gap among young learners. Understanding these gaps is crucial for developing targeted interventions that can bridge the divide between knowing and doing. The findings of this research are to develop the curriculum in a better way that follows environmental policy so that the curriculum is more rich and effective which will promote awareness and behavioural change in students. In conclusion, as the world continues to grapple with escalating environmental challenges, the role of education in shaping environmentally responsible citizens becomes increasingly important. By focusing on environmental literacy at the elementary level, this study underscores the need to nurture informed, concerned, and active individuals who are capable of contributing to a more sustainable future.

Review of Related Literature

Environmental literacy has gained increasing attention in recent years as a key component of sustainable education. It is commonly conceptualized as a multidimensional construct encompassing environmental awareness (knowledge), attitudes (values), and practices (behaviour). Contemporary research emphasizes that developing environmental literacy at the elementary level is essential for fostering responsible environmental citizenship.

Recent studies indicate that elementary learners generally demonstrate **basic environmental awareness**, primarily focused on fundamental concepts such as pollution, recycling, and conservation.

Utari (2025) conducted a systematic literature review on eco-literacy in elementary education and found that environmental learning at early grades effectively builds foundational knowledge but often lacks depth in addressing complex environmental issues.

Naila et al. (2025) found that interdisciplinary approaches, digital tools, and outdoor experiential learning significantly enhance students' environmental awareness, critical thinking, and problem-solving skills.

Similarly, Marlina et al. (2025) identified both opportunities and challenges in implementing Eco literacy, noting that while natural environments and local contexts provide rich learning opportunities, barriers such as limited teacher expertise and lack of policy support hinder effective implementation.

Coyle (2005) emphasized that environmental literacy extends beyond awareness to include skills, attitudes, and responsible behaviours.

Rickinson (2001) highlighted that environmental education research in primary and secondary schools was expanding but fragmented, with limited clarity on how learning outcomes translate into behaviour. This early work laid the foundation for later studies examining the relationship between awareness, attitudes, and practices.

Similarly, Choi et al. (2022) examined the impact of environmental education using picture books and reported that such instructional strategies significantly enhance students' understanding of environmental concepts at the primary level.

Noh and Bae (2024) suggest that while instructional interventions improve environmental literacy, students' conceptual clarity regarding abstract topics such as ecological sensitivity and sustainability remains limited.

In terms of **environmental attitudes**, recent literature consistently shows that elementary students exhibit positive dispositions toward environmental protection.

Kim and Bae (2024) found that zero-waste education based on the 5R principles (Refuse, Reduce, Reuse, Recycle, Rot) significantly improved students' environmental conservation attitudes, highlighting the role of structured environmental programs in shaping values and perceptions.

Jang et al. (2024) demonstrated that climate change project-based learning positively influenced students' perceptions and attitudes toward environmental issues. These findings suggest that experiential and project-based approaches are particularly effective in nurturing positive environmental attitudes among young learners.

Despite these encouraging findings, research on **environmental practices** reveals inconsistencies between students' knowledge and behaviour.

Ko and So (2024) reported that project-based carbon neutrality education improved students' environmental literacy and encouraged action-oriented behaviour; however, the extent of behavioural change varied among students, indicating that knowledge does not always translate into consistent practice.

Ardoin et al. (2017) analysed K–12 environmental education research and reported that most studies demonstrated positive outcomes in environmental knowledge and attitudes. However, they also noted inconsistencies in behavioural outcomes, indicating that knowledge and attitudes do not automatically translate into action.

Roth (1992) conceptualized environmental literacy as the ability to understand environmental systems and take responsible action. Later scholars emphasized its multidimensional nature, including cognitive (knowledge), affective (attitudes), and behavioural (actions) domains.

Hungerford and Volk (1990) proposed that environmental education should aim to produce environmentally responsible behaviour by influencing knowledge, attitudes, and skills.

Tilbury (1995) highlighted the importance of sustainability-oriented education that empowers learners to act responsibly.

Palmer (1998) found that while children are aware of environmental issues such as pollution and conservation, their understanding is often fragmented and lacks depth. This suggests the need for structured and age-appropriate environmental education programs.

Leeming et al. (1995) state that environmental attitudes encompass learners' beliefs, values, and emotional responses toward the environment. Studies have consistently shown that children tend to exhibit positive attitudes toward nature and environmental protection (Leeming et al., 1995).

Kollmuss and Agyeman (2002) identified several barriers to pro-environmental behaviour, including lack of motivation, limited opportunities, and external constraints.

Safitri et al. (2023) observed that although Eco literacy is introduced in schools, students' environmental awareness does not always improve in practice, as evidenced by persistent behaviours such as improper waste disposal. This reinforces the existence of the "awareness–action gap" in environmental education.

A recurring theme across recent literature is the existence of an "awareness–action gap." While students may possess adequate knowledge and positive attitudes, their daily environmental practices—such as waste segregation, energy conservation, and water-saving behaviours—are often irregular.

The gap between environmental knowledge and behaviour is widely documented. This gap highlights the need for educational approaches that go beyond knowledge transmission and focus on behaviour change. In conclusion, recent literature (2022–2025) highlights that while elementary learners demonstrate moderate environmental awareness and positive attitudes, translating these into consistent environmental practices remains a challenge. There is a clear need for integrated, context-specific, and practice-oriented environmental education that bridges the gap between knowledge, attitudes, and action. The present study contributes to this growing body of research by examining environmental literacy holistically among elementary learners.

Research Gap

While previous studies have explored individual components of environmental literacy, limited research has examined environmental awareness, attitudes, and practices collectively among elementary learners. Furthermore, there is a need for context-specific qualitative studies to better understand environmental literacy across diverse educational settings.

Objectives of the Study

- To assess the level of environmental awareness among elementary learners.
- To examine students' attitudes toward environmental conservation.
- To explore environmental practices adopted by students.
- To understand the relationship among awareness, attitudes, and practices.

Research Questions

- What is the level of environmental awareness among elementary learners?
- What attitudes do students exhibit toward environmental protection?
- How do students engage in environmental practices in their daily lives?
- How are awareness, attitudes, and practices interrelated?

Methodology

Research Design

The study adopted a qualitative research design to gain in-depth insights into students' environmental awareness, attitudes, and practices.

Sample

The sample consisted of 120 elementary students selected using stratified sampling to ensure representation across grade levels.

Instruments

- Environmental Literacy Questionnaire (used in an open-ended format)
- Observation Checklist
- Teacher Interviews

To obtain comprehensive and triangulated data, multiple qualitative instruments were employed:

Environmental-Literacy-Questionnaire(Open-ended-Format)

A researcher-developed questionnaire was used to explore students' understanding, perceptions, and behaviours related to environmental issues. The instrument consisted of three sections:

- **Awareness:** Questions focused on students' knowledge of environmental concepts such as pollution, conservation, recycling, climate change, and biodiversity. Students were asked to explain concepts in their own words and provide examples from daily life.
- **Attitudes:** This section included questions designed to capture students' feelings, beliefs, and values regarding environmental protection. Students expressed their opinions on issues like environmental responsibility, conservation efforts, and the importance of protecting natural resources.
- **Practices:** Questions explored students' day-to-day environmental behaviours, such as waste management, energy conservation, water usage, and participation in eco-friendly activities.

The open-ended format allowed students to respond freely, enabling deeper insights into their thoughts and experiences rather than limiting them to fixed responses.

A researcher-developed questionnaire was used to explore students' understanding, perceptions, and behaviours related to environmental issues. The instrument consisted of three sections:

A. Awareness: What do you understand by the term "environment"?

- Can you explain what pollution is? Give examples.
- What do you know about recycling? Why is it important?
- Have you heard of climate change or global warming? What do you think it means?
- What are some causes of environmental problems in your surroundings?

B. Attitudes: How do you feel when you see pollution in your surroundings?

- Do you think it is important to protect the environment? Why?

- Would you like to participate in activities like tree plantation or cleanliness drives? Why or why not?
- Who do you think is responsible for protecting the environment?
- How important is a clean environment to your daily life?

C. Practices

- What do you do with waste at home or school?
- Do you try to save water or electricity? How?
- Do you use plastic items? If yes, how often?
- Have you ever planted a tree or taken part in any environmental activity?
- What changes have you made in your daily life to help the environment?

The open-ended format allowed students to express their ideas freely, enabling deeper understanding of their knowledge, beliefs, and behaviours.

Observation-Checklist

A structured observation checklist was used to record students' actual environmental behaviours within the school setting. The checklist included indicators such as:

- Proper disposal of waste
- Practice of waste segregation
- Use of dustbins
- Conservation of water (e.g., turning off taps)
- Energy-saving habits (e.g., switching off lights and fans)
- Participation in cleanliness or eco-friendly activities

Observations were conducted during regular school hours to capture natural behavior. This instrument helped validate the consistency between students' reported practices and their actual actions.

Teacher-Interviews-(Semi-structured)

Semi-structured interviews were conducted with teachers to gather additional perspectives on students' environmental literacy. An interview guide was used, covering areas such as:

- Students' level of environmental awareness
- Observed attitudes toward environmental issues
- Behavioural patterns in daily school activities
- Effectiveness of environmental education in the curriculum
- Challenges in promoting environmentally responsible behaviour among students

The flexible nature of semi-structured interviews allowed teachers to elaborate on their experiences and provide context-specific insights, thereby enriching the data.

Validity and Reliability of Tools

Ensuring the validity and reliability of research instruments is essential to maintain the accuracy and credibility of the study. In the present study, multiple strategies were adopted to establish both the validity and reliability of the tools used, namely the Environmental Literacy Questionnaire, Observation Checklist, and Teacher Interview Schedule.

Validity of Tools

Content-Validity:

The instruments were carefully developed based on an extensive review of relevant literature on environmental literacy, particularly focusing on the dimensions of awareness, attitudes, and

practices. The tools were examined by experts in the fields of education and environmental studies to ensure that the items adequately covered all aspects of the construct. Necessary modifications were made based on their suggestions to improve clarity, relevance, and comprehensiveness.

Face-Validity:

The tools were reviewed to ensure that the items appeared appropriate, clear, and understandable for elementary-level students. Simple and age-appropriate language was used, particularly in the questionnaire, to ensure that students could interpret and respond to the questions effectively.

Construct-Validity:

The instruments were designed to align with the three core components of environmental literacy—awareness, attitudes, and practices. Each section of the questionnaire and observation indicators directly reflected these constructs, ensuring that the tools measured what they were intended to assess.

Triangulation:

Data were collected using multiple tools (questionnaire, observation, and teacher interviews), which enhanced the overall validity of the study. The convergence of findings from different sources helped in cross-verification and strengthened the authenticity of the results.

Reliability of Tools

Pilot-Testing

The Environmental Literacy Questionnaire and Observation Checklist were pilot-tested on a small group of students similar to the study sample. This helped identify ambiguities, unclear wording, and practical difficulties in administration. Necessary revisions were made to improve the consistency and usability of the tools.

Internal-Consistency:

Although the questionnaire was open-ended in nature, consistency was ensured by maintaining uniform structure and clearly defined themes across all items. Coding procedures were standardized during data analysis to maintain consistency in interpretation.

Inter-Rater-Reliability(Observation):

To ensure reliability in observational data, clear criteria and indicators were defined in the observation checklist. Where applicable, observations were cross-checked to minimize subjective bias and maintain consistency in recording behaviours.

Reliability-of-Interview-Data:

For teacher interviews, a semi-structured interview guide was used to maintain uniformity across participants while allowing flexibility. Responses were recorded and analysed systematically to ensure consistency in interpretation.

Overall, the combined use of validated tools, pilot testing, standardized procedures, and triangulation ensured that the instruments used in this study were both valid and reliable, thereby enhancing the credibility and trustworthiness of the findings.

Data Collection Procedure

Data were collected through classroom interactions, open-ended questionnaire responses, and direct observation. Teacher interviews were conducted to provide contextual understanding and support data triangulation.

Data Analysis

The collected data were analysed using thematic analysis. Responses from questionnaires and interviews were coded and categorized into themes, while observational data were used to support and validate emerging patterns related to awareness, attitudes, and practices.

Results and Discussion

Environmental Awareness

It is clear that students possess a moderate awareness level in regards to environmental awareness. Maximum students were able to correctly identify and explain fundamental environmental concepts such as pollution, conservation, and recycling. It further indicates by the study that basic and primary environmental education has reached students effectively, likely through school curricula, media exposure, and community discussions.

The students, when asked questions on complex issues such as climatic change, sustainable development, global warming, biodiversity loss, it was found that the idea was not at all clear & in-depth knowledge was not satisfactory.

Many students showed some knowledge but couldn't clarify certain ideas that lead to environmental hazards, as they lack the ability to connect causes, consequences, and long-term implications. This suggests that while foundational awareness exists, there is a need for deeper, concept-based learning that encourages critical thinking and real-world application.

Environmental Attitudes

The study indicates that students generally exhibit positive attitudes toward environmental protection. Most respondents expressed concern about environmental degradation, particularly issues such as air and water pollution. They also showed emotional engagement, indicating that they value a clean and healthy environment. Furthermore, a significant proportion of students expressed a willingness to participate in eco-friendly initiatives, such as tree plantation drives, cleanliness campaigns, and awareness programs. This positive disposition reflects the effectiveness of value-based education and societal messaging regarding environmental responsibility. It is to be remembered that only a positive attitude towards environmental awareness cannot alone take it to action. While students "care" about the environment, this concern does not always manifest in consistent behavioural patterns.

Environmental Practices

Despite having moderate awareness and favourable attitudes, students' actual environmental practices were found to be inconsistent and irregular. Activities such as waste segregation, reduction of plastic use, energy conservation, and water-saving habits were not consistently practiced in daily life. For example, although students were aware of the importance of waste management, only a limited number reported regularly separating biodegradable and non-biodegradable waste. Similarly, practices like turning off unused electrical appliances or conserving water were followed occasionally rather than habitually. This inconsistency suggests the presence of behavioural gaps, possibly influenced by external factors such as lack of infrastructure (e.g., absence of proper waste disposal systems), insufficient parental or institutional reinforcement, and limited opportunities to practice environmentally responsible behaviours in structured settings.

Relationship among Variables

The analysis of relationships among awareness, attitudes, and practices provides important insights. A clear positive link between environmental awareness and attitudes was observed, suggesting that increased knowledge tends to nurture more positive perceptions and a stronger sense of concern toward environmental issues. The connection between awareness and practices appears to be present but less consistent, indicating that while knowledge can influence behaviour, it does not automatically lead to action. Similarly, attitudes show only a partial influence on practices, implying that even when students express favourable views toward the environment, these views are not always reflected in their everyday behaviours. These findings emphasize that environmental behaviour is complex and multi-dimensional. It is shaped not only by knowledge and attitudes but also by situational, social, and structural factors that can either support or limit the translation of awareness into meaningful action

Discussion

The overall findings confirm the existence of an “awareness–action gap” among students. While they are reasonably informed and display positive attitudes toward environmental protection, this does not consistently lead to responsible environmental practices.

Several factors may contribute to this gap:

Lack of practical exposure: Students may not have enough hands-on opportunities to engage in environmental activities that reinforce learning.

Insufficient reinforcement mechanisms: Without continuous encouragement from schools, families, and communities, environmentally responsible behaviours may not become habitual.

Limited integration into daily routines: Environmental education often remains theoretical rather than being embedded in everyday practices and school culture.

External constraints: There was lack of certain facilities, such as proper waste management systems or water-saving infrastructure like rainwater harvesting, can hinder behavior change of students.

These findings suggest that environmental education should move beyond theoretical instruction and focus on experiential learning, behavioural interventions, and institutional support systems. Schools should incorporate activity-based programs, eco-clubs, and community engagement initiatives to bridge the gap between knowledge and action. It is to be noted that while the positive attitude exists amongst students towards environmental awareness. It requires consistent and continuous efforts to change these into daily habits and meaningful environmental practices that can gift us a greener & better world.

Conclusion

The study suggests that most elementary school students already have a basic understanding of environmental issues and generally feel that protecting the environment is important. This is a positive sign, as it shows that early education is helping children become aware of topics like pollution, conservation, and sustainability. Many students express concern about environmental problems and seem willing, at least in theory, to do their part. However, when we look at their everyday behaviour, a different picture often emerges. Their actions do not always match what they know or believe. This gap between awareness and actual practice is not surprising, but it is

important. It highlights a common challenge in education—knowing something does not always mean acting on it. For instance, a child may understand why saving water matters but still forget to turn off a running tap. Similarly, students might talk about recycling in class but fail to separate waste properly at school or at home. These small but meaningful inconsistencies suggest that environmental education needs to go a step further. Rather than focusing only on information and attitudes, there is a need to help students build habits. This requires a more practical and connected approach, where learning is not limited to textbooks or classroom discussions. Children tend to learn better when they are actively involved, when they can see and experience the results of what they are doing. Simply telling them what is right is often not enough; they need opportunities to practice it regularly. Simple initiatives—like maintaining a small garden, organizing clean-up drives, or encouraging students to bring reusable materials—can create a difference. When students take part in such activities, they begin to understand that their actions, even small ones, matter. Over time, these experiences can help turn awareness into routine behaviour. Teachers, too, are central to this process. If teachers consistently practices environmentally responsible behaviour, it sends a strong message to the students. The teachers can create a classroom environment where students feel encouraged to think, ask questions, and reflect on their own habits. Often children are influenced by informal conversations or small reminders n their daily lives. At the end the study points to something quite simple but important: awareness alone is not enough. While it is encouraging that young learners already show concern for the environment, the real goal is to help them act on that concern. Hands-on training, activity based learning and by guiding students in a consistent and supportive way, schools and teachers can help bridge the gap between what children know and what they actually do. In the coming days, this can lead to the development of responsible habits that stay with them as they grow

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