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## *Assessing Environmental Awareness Integration in the Curriculum: A Case Study of Lahore's Private Schools*

### ABSTRACT

*This study explores the integration of environmental education (EE) in private schools in Lahore, focusing on the methods employed, challenges encountered, and its impact on students' environmental knowledge, attitudes, and behaviors. Data were collected through interviews with school administrators, teachers, and students, providing insights into current practices and barriers to effective EE implementation. The findings reveal that while schools utilize strategies such as interdisciplinary teaching, project-based learning, and environmental clubs to incorporate EE, they face challenges, including limited resources, insufficient teacher training, and time constraints due to a crowded curriculum. The study highlights the positive influence of EE on students, with increased awareness and a demonstrated shift toward environmentally responsible behaviors, such as recycling and energy conservation. Furthermore, institutional commitment and external support from organizations were identified as critical enablers of successful EE integration. The research emphasizes the need for policy interventions to prioritize EE, including dedicated curricula, teacher professional development, and school-wide sustainability initiatives. It concludes that overcoming existing barriers can unlock the transformative potential of EE, equipping students with the knowledge, values, and skills necessary to address environmental challenges and foster sustainable practices in their communities.*

**Keywords:** *Environmental education, private schools, curriculum integration, sustainability, student behavior*

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## **Introduction**

Environmental education is a cornerstone of sustainable development, providing students with the knowledge, skills, and attitudes necessary to address the escalating environmental challenges of our era. Globally, it is recognized as a critical element of the education system, fostering awareness and enabling individuals to make informed decisions to protect and sustain the environment. According to the United Nations' Sustainable Development Goal 4 (SDG 4), quality education must include the promotion of sustainable practices and environmental consciousness. Despite its global relevance, the implementation of environmental education often varies significantly across regions, with contextual challenges shaping its scope and impact.

Lahore, a major urban hub in Pakistan, faces numerous environmental challenges, including increasing air and water pollution, inadequate waste management, and the growing effects of climate change. These issues underscore the urgency of fostering environmental awareness among the city's younger generation. Private schools, often perceived as pioneers of educational innovation due to their flexible curricula and resource availability, play a crucial role in this endeavor. They have the potential to integrate environmental concepts across disciplines, promoting holistic understanding and action among students. However, the extent to which this potential is realized remains underexplored. Existing studies on environmental education in Pakistan often highlight systemic challenges, such as insufficient teacher training, limited resources, and a lack of emphasis on environmental topics in national curricula. However, private schools in urban centers like Lahore may be better positioned to overcome these barriers. By embedding environmental education into their curricula and adopting multidisciplinary approaches, these schools can empower students to become proactive agents of change. Understanding how private schools approach this task can offer valuable insights into the effectiveness of their strategies and their alignment with global standards of environmental education.

This study seeks to examine the integration of environmental awareness within the curricula of private schools in Lahore. It focuses on the methods employed by educators, the extent to which environmental themes are interwoven into various subjects, and the outcomes of these efforts on students' knowledge and attitudes. By evaluating current practices, the research aims to identify gaps and opportunities for improvement, contributing to the broader discourse on advancing environmental education in Pakistan.

## **Background of the Research**

Environmental challenges, including climate change, pollution, deforestation, and biodiversity loss, pose significant threats to global sustainability. These issues have highlighted the need for cultivating environmental awareness and responsibility, particularly among younger generations who will inherit and manage these challenges in the future. Environmental education (EE) has been globally recognized as a vital component of the educational process, fostering an understanding of ecological interdependence and promoting sustainable behavior.<sup>1</sup>

In Pakistan, environmental issues such as rising air and water pollution, urban waste mismanagement, and unsustainable resource usage are becoming increasingly critical, particularly in urban centers like Lahore. The deteriorating environmental conditions necessitate a proactive approach to environmental education, where schools can play a pivotal role in shaping students' environmental attitudes and behaviors. Despite its inclusion in national policy frameworks, the implementation of EE in Pakistan has been inconsistent,

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<sup>1</sup> UNESCO. (2017). Education for sustainable development goals: Learning objectives. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000247444>

with gaps in curriculum design, teacher training, and resource allocation. Private schools, particularly in urban areas like Lahore, are often at the forefront of educational innovation due to their relatively higher resources and curriculum flexibility. These institutions have the potential to integrate environmental themes across various subjects, promoting a multidisciplinary approach to EE. However, the extent to which this potential is realized, the methodologies employed, and the outcomes achieved remain underexplored.

Recent mandates, such as the Lahore High Court's directive requiring schools to dedicate one period per week to environmental education, have underscored the importance of incorporating environmental topics into school curricula.<sup>2</sup> Simultaneously, initiatives like the WWF Green School Programme and the Clean Green School Programme by NGOs have sought to bridge gaps by engaging students and teachers in structured environmental awareness activities.<sup>3</sup> Despite these efforts, there remains a lack of systematic studies examining how effectively private schools in Lahore are integrating environmental education into their curricula and its impact on fostering environmental awareness among students.

This research aims to address this gap by exploring the integration of environmental education in private schools in Lahore. It investigates the approaches adopted by educators, the extent to which environmental topics are embedded into various subjects, and the outcomes in terms of student awareness and behavior. By focusing on private schools, the study seeks to provide insights into the opportunities and challenges of implementing EE in an urban educational context, contributing to the broader discourse on advancing sustainable education in Pakistan.

Environmental education (EE) is pivotal in fostering sustainable development and equipping students with the knowledge and skills necessary to address environmental challenges. Globally, integrating EE into school curricula has been recognized as essential for promoting environmental awareness and responsible behavior among students.<sup>4</sup>

In Pakistan, the integration of EE into educational curricula has been gradual. The Lahore High Court mandated that schools and colleges dedicate one period per week to environmental protection and plant life education, aiming to cultivate environmentally conscious citizens.<sup>5</sup> Additionally, the United States partnered with the Teachers' Resource Center to launch Pakistan's first climate change curriculum for schools, marking a significant step toward structured environmental education.<sup>6</sup> Private schools in Lahore have shown varying degrees of commitment to integrating EE. Programs like the WWF Green School Programme engage students and teachers in structured annual awareness initiatives to foster individual responsibility toward nature conservation.<sup>7</sup> However, the extent and effectiveness of EE integration in private schools' curricula remain underexplored.

Studies indicate that while some private schools incorporate environmental topics, challenges persist, including limited teacher training, insufficient resources, and a lack of standardized curricula. A study assessing the knowledge and attitudes of public and private school students

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<sup>2</sup> Dawn. (2023). Lahore High Court mandates environmental education in schools. Retrieved from <https://www.dawn.com/news/1869574>

<sup>3</sup> WWF-Pakistan. (2023). Green School Programme. Retrieved from <https://www.wwf-pakistan.org/take-action/environmental-education/green-school-programme> & WaterAid Pakistan. (2023). Clean Green School Programme. Retrieved from <https://www.wateraid.org/pk/clean-green-school-programme>

<sup>4</sup> UNESCO. (2017). Education for Sustainable Development Goals: Learning Objectives. *UNESCO Publishing*.

<sup>5</sup> Dawn. (2023). Lahore High Court Mandates Environmental Education in Schools. *Dawn News*.

<sup>6</sup> U.S. Embassy & Consulates in Pakistan. (2023). U.S. and Pakistan launch first climate change curriculum for schools. Retrieved from <https://pk.usembassy.gov/u-s-and-pakistan-launch-first-climate-change-curriculum-for-schools/>

<sup>7</sup> WWF-Pakistan. (2023). Green School Programme. Retrieved from <https://www.wwf-pakistan.org/take-action/environmental-education/green-school-programme/>

in Lahore regarding plastic pollution found that only 47.3% of the selected population was aware of plastic waste issues, highlighting the need for enhanced EE.<sup>8</sup> The role of non-governmental organizations (NGOs) and international partnerships has been instrumental in promoting EE in Pakistan. Initiatives like the Clean Green School Programme by WaterAid Pakistan focus on action-based learning and climate literacy in schools, aiming to instill environmental consciousness among students.<sup>9</sup> Despite these efforts, a comprehensive understanding of how private schools in Lahore integrate EE into their curricula is lacking.

### **Statement of the Problem**

Environmental degradation is a critical global concern, and Pakistan is no exception, facing significant challenges such as air and water pollution, deforestation, and climate change. Urban centers like Lahore, characterized by rapid population growth and industrialization, bear the brunt of these issues, making environmental awareness a necessity. Schools, as foundational institutions for shaping future generations, have a crucial role in fostering this awareness through environmental education (EE). Despite national and global emphasis on integrating EE into curricula, its implementation in Pakistan remains inconsistent and underdeveloped. Private schools in urban areas like Lahore, which often have greater autonomy and resources compared to public institutions, are uniquely positioned to incorporate environmental education into their curricula. However, there is a lack of systematic research on how these schools integrate EE, the approaches adopted, and their effectiveness in promoting environmental awareness among students.

Key challenges such as limited teacher training, lack of standardized curricula, and inadequate resources further exacerbate the problem. Without a clear understanding of how EE is implemented in private schools, opportunities to enhance its integration and effectiveness may be missed. This gap hinders efforts to equip students with the knowledge and skills necessary to address pressing environmental issues and adopt sustainable practices. Therefore, this research seeks to explore the current state of EE integration in private schools in Lahore. It aims to identify the strategies employed, challenges faced, and outcomes achieved in fostering environmental awareness among students. The findings will contribute to developing targeted strategies for improving EE implementation, ultimately empowering students to become proactive stewards of the environment.

### **Research Objective**

- To explore the integration of environmental education into the curricula of private schools in Lahore and its impact on fostering environmental awareness among students.

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### **Research Questions**

- How is environmental education integrated into the curricula of private schools in Lahore?
- What is the impact of environmental education on students' knowledge, attitudes, and behaviors toward environmental issues in private schools in Lahore?

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<sup>8</sup> Mukhtar, S., Asad, A., Mumtaz, M., Saeed, A. U., Qadir, A., Ahmad, S. R., & Saeed, H. F. U. (2023). Role of knowledge and attitude of public and private school students for plastic pollution awareness, usage, and management in Lahore, Pakistan. *Journal of Material Cycles and Waste Management*, 26, 175–183. <https://doi.org/10.1007/s10163-023-01816-3>

<sup>9</sup> WaterAid Pakistan. (2023). Clean Green School Programme: Promoting Environmental Education in Schools. *WaterAid Pakistan*.

## Significance of the Study

This study holds significant importance as it addresses the urgent need for environmental education (EE) in Pakistan, particularly in urban centers like Lahore, which face severe environmental challenges such as pollution and climate change. By focusing on private schools, the research investigates how these institutions, with their relative autonomy and access to resources, integrate EE into their curricula and play a pivotal role in shaping environmentally conscious citizens. The findings are valuable for multiple stakeholders. For educational institutions, the study provides critical insights into current practices and gaps in EE implementation, offering avenues for enhancing curricula and teaching strategies to better address environmental concerns. Policymakers can leverage the evidence-based recommendations to design and enforce effective guidelines for integrating EE in schools, aligning with national and global sustainability objectives. Educators stand to benefit from the identification of effective strategies and challenges, equipping them with practical approaches to engage students and foster active learning on environmental issues. Additionally, the study highlights the impact of EE on students' knowledge and behavior, encouraging greater collaboration between schools and families to promote sustainable practices at home and within communities. Finally, for researchers, this work contributes to the growing body of literature on EE in developing countries, offering a context-specific perspective that can guide future research in similar environments. By aiming to improve environmental education in Lahore's private schools, this study contributes to the broader goal of fostering a more environmentally aware and responsible society.

## Theoretical Framework

The theoretical foundation of this study integrates insights from the Environmental Literacy Model<sup>10</sup> and Constructivist Learning Theory<sup>11</sup> to examine the integration of environmental education (EE) into the curricula of private schools in Lahore. Together, these theories offer a comprehensive lens to understand how students acquire knowledge, attitudes, and skills to address environmental challenges and how teaching strategies can facilitate this process effectively. The Environmental Literacy Model provides a framework for evaluating the outcomes of EE by focusing on four critical components: knowledge, attitudes, skills, and behavior. This model aligns with the study's aim to assess how well private school curricula prepare students to understand environmental concepts, feel responsible toward ecological issues, and adopt sustainable practices. It emphasizes the progression from awareness to action, which is a key focus of this research.

Constructivist Learning Theory complements this by highlighting the role of active, experiential learning in achieving environmental literacy. It underscores the importance of teaching strategies that involve hands-on activities, collaborative projects, and real-world problem-solving. These methods are vital for fostering deep understanding and encouraging students to apply their knowledge to practical environmental challenges. In combination, these theories suggest that an effective integration of EE requires not only a curriculum that builds environmental literacy but also pedagogical approaches that actively engage students in meaningful learning experiences. The interaction between these theories provides a holistic understanding of how EE can be implemented in private schools to achieve transformative educational outcomes.

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<sup>10</sup> Roth, C. E. (1992). Environmental Literacy: Its Roots, Evolution, and Directions in the 21st Century. *Journal of Environmental Education*, 24(4), 19-23.

<sup>11</sup> Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.

## **Research Methodology**

This study adopted a qualitative research design to explore the integration of environmental education (EE) into the curricula of private schools in Lahore, focusing on educators' approaches, curriculum content, and student outcomes. A case study approach was employed, as it allowed for in-depth investigation of the practices in selected private schools, providing insights into the challenges and strategies involved in embedding environmental awareness into school curricula.

## **Research Design**

A qualitative case study methodology was used to gather detailed information on how environmental education was integrated into the curricula of private schools in Lahore. This design was chosen because it enabled the exploration of complex, context-specific phenomena and provided a deep understanding of the practices, challenges, and impacts of EE integration.

## **Population and Sample**

The population for this study consisted of private schools in Lahore that had voluntarily integrated environmental education into their curricula. A purposive sampling technique was used to select six private schools, ensuring a mix of schools with different curriculum structures, resources, and teaching methodologies. The selected schools were classified based on their affiliation with various educational systems, including O/A levels and matriculation systems.

The participants of the study included:

- **Teachers:** A total of 18 teachers (3 from each school) were selected based on their involvement in teaching environmental education topics. These teachers were from various subject areas, including science, social studies, and languages, reflecting the interdisciplinary nature of environmental education.
- **Students:** A total of 60 students (10 from each school) were selected, including a mix of boys and girls from different grade levels. The students were selected from classes where environmental topics were being taught.

## **Data Collection**

Data were collected through semi-structured interviews, classroom observations, and document analysis. These methods were employed to gather rich, comprehensive data about the integration of environmental education in the selected schools.

- **Semi-Structured Interviews:** Interviews were conducted with 18 teachers to understand their approaches, challenges, and experiences in integrating environmental education into their curricula. The interviews were designed to elicit responses on the teachers' pedagogical strategies, knowledge of environmental issues, and perceptions of student engagement with environmental topics.
- **Classroom Observations:** Classroom observations were conducted in 6 classrooms (1 from each school) during lessons where environmental topics were being taught. The observations focused on how environmental education was being incorporated into the lessons, the teaching methods used, student participation, and the types of materials employed to teach environmental concepts.
- **Document Analysis:** The curricula, lesson plans, and teaching resources from each school were analyzed to examine the extent to which environmental topics were embedded in different subjects. The document analysis also helped identify the resources and materials used by teachers to teach environmental concepts.

## Data Analysis

The data collected from the interviews, observations, and document analysis were analyzed using thematic analysis. Thematic analysis was chosen because it allowed for the identification of patterns and themes across the data related to the integration of environmental education. The analysis process involved the following steps:

- **Data Familiarization:** The interview transcripts, observation notes, and documents were reviewed thoroughly to gain an understanding of the content and context.
- **Coding:** Key phrases and ideas were coded in the data to identify initial themes. This coding process involved categorizing the data into meaningful chunks related to the research questions, such as the methods of integration, the impact on student knowledge and behavior, and challenges faced by educators.
- **Theme Identification:** Once the initial codes were identified, the data were grouped into broader themes. The main themes identified were: 1) Methods of integrating environmental education, 2) Teachers' perceptions and experiences, 3) Student engagement and outcomes, and 4) Barriers and challenges.
- **Interpretation:** The identified themes were interpreted in the context of the research questions. The findings were compared across schools to identify patterns and variations in the approaches to integrating environmental education and the outcomes achieved.

## Ethical Considerations

Ethical approval for the study was obtained from the relevant authorities at the institutions involved. Informed consent was sought from all participants, including teachers, students, and their parents, ensuring their voluntary participation. Confidentiality was maintained throughout the study, with all data being anonymized and stored securely. The study adhered to ethical guidelines regarding data collection, ensuring no harm was caused to participants.

## Limitations

Several limitations were identified in this study. First, the sample size was small, as only six schools and 18 teachers were selected. This limited the generalizability of the findings to all private schools in Lahore. Additionally, the study focused only on the practices within private schools, which may differ from those in public schools. Furthermore, the study relied on self-reported data from teachers and students, which may be subject to bias. Despite these limitations, the study provided valuable insights into the integration of environmental education in Lahore's private schools, highlighting both the opportunities and challenges faced by educators and students in promoting environmental awareness.

**Table 1: Themes and Subthemes**

Subthemes	Theme
Environmental awareness activities	Methods of Integrating Environmental Education
Interdisciplinary approach	
Project-based learning	
Curriculum inclusion	Barriers and Challenges in Integration
Limited resources	
Lack of teacher training	
Lack of time	Impact on Student Knowledge and Behavior
Positive student responses	
Environmental clubs	
Student awareness	Support for Environmental Education Integration
School policy support	

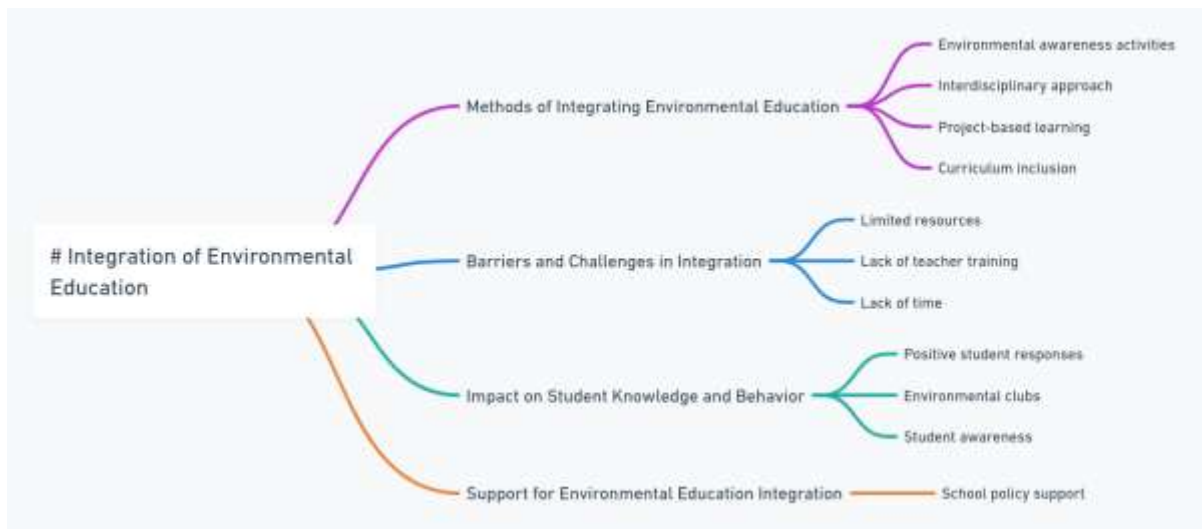


Figure 1: Mind Map of Integration of Environmental Education

## 1. Methods of Integrating Environmental Education

This theme highlights various approaches educators use to embed environmental education into their teaching practices. The interdisciplinary approach connects environmental topics with core subjects like science, social studies, and languages, making abstract issues like climate change tangible for students. Project-based learning emphasizes experiential, hands-on methods, such as creating sustainable projects or conducting campaigns, fostering student engagement and practical understanding. Environmental awareness activities expand learning beyond the classroom through extracurricular initiatives, such as workshops and interactive sessions, reinforcing theoretical knowledge with real-world application. These methods collectively ensure a comprehensive understanding of environmental issues across disciplines.

- **Interdisciplinary Approach**

Many teachers mentioned how they integrated environmental education into subjects such as science, social studies, and languages. The interdisciplinary approach allows educators to seamlessly weave environmental topics into traditional subjects. For instance, linking climate change discussions to biology lessons or using social studies to explore the societal impacts of deforestation helps students view environmental issues through multiple lenses. This approach ensures students see the relevance of environmental topics to real-world problems and connects their academic learning with pressing global challenges. Integrating these issues into language lessons, such as reading or writing assignments, further reinforces their importance and encourages critical thinking. One teacher explained:

*“We try to link environmental issues to the science curriculum. For example, we discuss the impact of climate change during our biology lessons, making it more relatable for students.”*  
(Teacher 3)

- **Project-Based Learning**

Several teachers highlighted their use of project-based learning to make environmental education more hands-on. Project-based learning engages students in active, hands-on activities that emphasize practical solutions. Projects like building



sustainable gardens, organizing recycling drives, or creating energy conservation campaigns allow students to apply their knowledge to tangible outcomes. This approach nurtures problem-solving skills, teamwork, and a sense of responsibility toward environmental stewardship. By participating in these projects, students are more likely to retain what they learn and translate their insights into real-life actions, thereby bridging the gap between theory and practice. One teacher shared:

*"Students work on projects like creating a sustainable garden or conducting a recycling campaign. It's more than just theory; it's practical learning." (Teacher 6)*

- **Environmental Awareness Activities**

Teachers noted the importance of extra-curricular activities in enhancing environmental awareness. Extracurricular environmental activities provide opportunities for students to deepen their understanding outside the traditional classroom. Workshops on waste management, carbon footprint reduction, and other environmental topics create a platform for experiential learning. These activities often involve community engagement, fostering a sense of accountability and empowering students to act as change agents. By participating in these events, students not only learn about sustainability but also develop the confidence to lead by example in their homes and communities. One teacher said:

*"We hold regular environmental awareness sessions where students participate in workshops on waste management and reducing carbon footprints." (Teacher 4)*

## **2. Barriers and Challenges in Integration**

Despite the potential benefits, educators face significant hurdles in incorporating environmental education into the curriculum. Limited resources, such as insufficient teaching materials and tools, restrict creative and engaging lesson delivery. The absence of structured teacher training leaves educators feeling ill-equipped to handle environmental topics effectively, often requiring them to rely on personal efforts to bridge the gap. Additionally, a packed curriculum with tight schedules leaves minimal time for in-depth exploration of environmental issues, reducing the effectiveness of integration. These challenges underscore the need for systemic changes to facilitate effective environmental education.

- **Limited Resources**

Many teachers expressed that the lack of resources hindered their ability to implement effective environmental education. A lack of adequate resources, such as multimedia tools, interactive learning materials, or access to nature-based experiences, poses a significant challenge. Teachers often struggle to make environmental education engaging without the right tools, which limits the effectiveness of their teaching. For example, insufficient access to videos, infographics, or lab equipment can hinder students' ability to visualize and analyze environmental issues. This gap highlights the need for schools to invest in infrastructure and resources dedicated to environmental education. A teacher remarked:

*"We don't have enough teaching materials, like interactive displays or videos, to truly engage students in environmental topics. It limits what we can do in class." (Teacher 2)*

- **Lack of Teacher Training**

Many educators feel unprepared to teach environmental topics due to inadequate professional development opportunities. Without training, they may lack the pedagogical strategies needed to effectively integrate environmental themes into existing curricula. Teachers are often left to devise their methods, leading to inconsistencies in how environmental education is delivered. Structured training programs and workshops can equip teachers with the tools and confidence to tackle environmental subjects more effectively. One teacher shared:

*“There’s no proper training for us on how to teach environmental topics. Most of us have to learn on the job, and sometimes it feels like we are not doing enough.”*  
(Teacher 5)

### **Lack of Time**

Many teachers found it difficult to dedicate time to environmental education due to a packed curriculum. A crowded curriculum leaves little room for in-depth discussions on environmental topics. Teachers often have to prioritize completing the syllabus over exploring broader issues, which can reduce environmental education to surface-level mentions. For example, while topics like climate change might be included, they are frequently rushed, preventing students from developing a nuanced understanding. This time constraint underscores the importance of streamlining curricula to incorporate environmental education more holistically. One teacher mentioned:

*“Our syllabus is so overloaded that we often have to rush through environmental topics. We don’t have enough time to cover them in-depth.”* (Teacher 1)

### **3. Support for Environmental Education Integration**

Institutional and policy support plays a crucial role in facilitating the inclusion of environmental education. Schools with explicit environmental policies empower teachers to prioritize these topics, fostering a sense of purpose and alignment within their teaching practices. Incorporating environmental education into the formal curriculum validates its importance and ensures consistency in its delivery across classrooms. School leadership and management support, such as providing resources and promoting policy changes, enable educators to integrate environmental education effectively and sustainably.

- **School Policy Support:**

Several teachers emphasized the importance of having institutional backing for the integration of environmental education. Supportive school policies are vital for embedding environmental education into daily teaching practices. Policies that mandate or encourage environmental topics ensure consistency and provide teachers with a clear framework. For example, a school policy that includes environmental sustainability goals can motivate educators to align their lessons with broader institutional priorities. This backing also fosters a culture of collaboration among teachers and students, making environmental education a shared responsibility. One teacher stated:

*"The school management is very supportive, and they've included environmental education in the school policy, which makes it easier for us to include these topics in our lessons."*  
(Teacher 6)

- **Curriculum Inclusion:**

Teachers acknowledged that the inclusion of environmental education in the school's formal curriculum helped reinforce its importance. When environmental education is explicitly included in the curriculum, it underscores its importance and ensures it is systematically taught. Such inclusion often comes with specific learning objectives, content guidelines, and assessments, which help educators approach the subject with clarity and purpose. For instance, a curriculum that integrates sustainability goals into science, social studies, or civic education creates opportunities for repeated reinforcement of key ideas, promoting deeper understanding. One teacher said:

*"The curriculum now explicitly mentions environmental education, so it's something we're encouraged to teach as part of the broader curriculum."* (Teacher 2)

#### **4. Impact on Student Knowledge and Behavior**

Integrating environmental education positively influences students' awareness, knowledge, and behavior. Teachers observe increased environmental consciousness, with students adopting sustainable practices, such as recycling and reducing plastic use, in their daily lives. Environmental clubs serve as catalysts for change, encouraging students to organize awareness campaigns and champion eco-friendly initiatives within their schools. These activities foster a culture of environmental responsibility, turning students into advocates for sustainability and influencing their peers to adopt similar practices, thereby extending the impact beyond individual classrooms.

- **Positive Student Responses:**

Teachers noted that students became more aware of environmental issues and showed positive changes in their behavior. Environmental education fosters a noticeable shift in students' awareness and behavior. Teachers report that students become more mindful of their ecological footprint, often initiating recycling efforts or adopting eco-friendly practices at home and school. This transformation reflects a deeper understanding of sustainability and a willingness to act on it, suggesting that environmental education has a lasting impact on student attitudes and values. One teacher reflected:

*"Students have started bringing up recycling and sustainability in their daily lives. Some have even started eco-friendly initiatives at school."* (Teacher 4)

- **Environmental Clubs:**

Teachers also reported that students who were actively involved in environmental clubs became ambassadors of sustainability within the school. Environmental clubs serve as dynamic platforms where students take an active role in promoting sustainability. These clubs often lead school-wide initiatives, such as awareness campaigns, tree-planting drives, or plastic reduction efforts. Members become

advocates of environmental causes, inspiring peers and fostering a culture of accountability. These clubs also provide leadership opportunities, encouraging students to think creatively and take ownership of environmental challenges within their communities. One teacher shared:

*“The students in the environmental club organize awareness campaigns and are very passionate about making changes, like reducing plastic usage around school.” (Teacher 3)*

### **Discussion**

The research revealed that various methods were employed by private schools in Lahore to integrate environmental education, including environmental awareness activities, interdisciplinary approaches, project-based learning, and direct curriculum inclusion. These methods are consistent with global best practices for EE, which emphasize active learning, real-world applications, and a holistic approach to environmental issues.<sup>12</sup> The use of interdisciplinary approaches was particularly prominent, as many educators recognized the importance of embedding environmental concepts across different subjects to foster a well-rounded understanding of environmental challenges. This approach aligns with the Environmental Literacy Model<sup>13</sup>, which stresses the integration of knowledge, attitudes, skills, and behavior to develop a comprehensive environmental understanding. Project-based learning was another prevalent method, where students were encouraged to engage in hands-on, real-world environmental projects. This aligns with the Constructivist Learning Theory<sup>14</sup>, which highlights the importance of experiential learning in fostering deep understanding. The findings support the idea that students learn best when they actively engage with the subject matter and apply their knowledge in practical contexts, such as environmental conservation projects.

Despite the use of these methods, several barriers were identified in the integration of EE into private school curricula. Limited resources, lack of teacher training, and insufficient time for EE within the existing curriculum were the most frequently cited challenges. These barriers have also been highlighted in previous studies on environmental education in Pakistan, where inconsistent teacher training and a lack of resources have hindered the effectiveness of EE programs.<sup>15</sup> The finding that teachers often lacked specific training in EE underscores the need for targeted professional development to equip educators with the necessary tools to teach environmental topics effectively. Moreover, the lack of time, given the already packed curricula, was seen as a significant limitation. This challenge is consistent with the difficulties faced by schools globally, where the integration of EE is often constrained by curriculum overload and competing educational priorities.<sup>16</sup>

The research indicated that environmental education positively impacted students' knowledge, attitudes, and behaviors regarding environmental issues. Many students demonstrated a greater awareness of environmental problems such as pollution, waste management, and climate change. Additionally, students reported positive changes in their

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<sup>12</sup> UNESCO. (2017). Education for sustainable development goals: Learning objectives. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000247444>

<sup>13</sup> Roth, C. E. (1992). Environmental Literacy: Its Roots, Evolution, and Directions in the 21st Century. *Journal of Environmental Education*, 24(4), 19-23.

<sup>14</sup> Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.

<sup>15</sup> WWF-Pakistan. (2023). Green School Programme: Engaging Students and Teachers in Environmental Awareness. *WWF-Pakistan*.

<sup>16</sup> UNESCO. (2017). Education for Sustainable Development Goals: Learning Objectives. *UNESCO Publishing*.

attitudes toward sustainable behaviors, such as recycling, energy conservation, and tree planting. This finding supports the Environmental Literacy Model, which emphasizes the progression from awareness to responsible action.<sup>17</sup> The positive responses from students indicate that EE when effectively integrated into the curriculum, can lead to tangible shifts in both knowledge and behavior.

Environmental clubs, another key finding of this study, played an essential role in reinforcing learning in the classroom. These extracurricular activities not only provided students with additional opportunities to engage with environmental topics but also helped them to translate their classroom knowledge into real-world action. This finding is consistent with the idea that active, hands-on learning experiences are crucial in fostering environmental literacy.<sup>18</sup> Finally, the study identified that support from school policy and administration was a crucial factor in the successful integration of EE. Schools with clear policies and environmental education commitments were more likely to implement successful EE programs. This aligns with findings from previous research, which suggests that institutional support is critical for the long-term success of environmental education initiatives.<sup>19</sup> The Lahore High Court's mandate for schools to dedicate one period per week to environmental education is an example of the type of policy intervention that can help institutionalize EE in schools.<sup>20</sup> Moreover, the involvement of external organizations, such as WWF-Pakistan and WaterAid Pakistan, in supporting EE initiatives was seen as beneficial. These organizations provided valuable resources and guidance, which helped schools overcome some of the challenges related to limited resources and teacher training. The role of NGOs in promoting EE in schools has been acknowledged globally as an important means of enhancing the effectiveness of environmental education.<sup>21</sup>

## Conclusion

This study examined the integration of environmental education (EE) within the curricula of private schools in Lahore, with a focus on the methods employed, barriers encountered, and the impact on students' knowledge, attitudes, and behaviors toward environmental issues. The findings reveal that, while there is an increasing recognition of the importance of environmental education, significant challenges persist that hinder its full integration. Nonetheless, the research underscores the potential of EE to influence both students' environmental awareness and their subsequent behaviors, contributing positively to a sustainable future. The study found that private schools in Lahore have adopted a range of strategies for integrating environmental education, including incorporating environmental topics into existing subjects, employing interdisciplinary teaching methods, and utilizing project-based learning. These approaches are consistent with global best practices in EE, which stress the importance of cross-curricular integration and active, hands-on learning. The use of environmental clubs further enriched this integration by providing extracurricular avenues for students to engage with environmental issues, reinforcing what they learned in the classroom.

<sup>17</sup> Roth, C. E. (1992). Environmental Literacy: Its Roots, Evolution, and Directions in the 21st Century. *Journal of Environmental Education*, 24(4), 19-23.

<sup>18</sup> Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.

<sup>19</sup> WaterAid Pakistan. (2023). Clean Green School Programme: Promoting Environmental Education in Schools. *WaterAid Pakistan*.

<sup>20</sup> Dawn. (2023). Lahore High Court mandates environmental education in schools. Retrieved from <https://www.dawn.com/news/1869574>

<sup>21</sup> WWF-Pakistan. (2023). Green School Programme. Retrieved from <https://www.wwf-pakistan.org/take-action/environmental-education/green-school-programme/>

## *Assessing Environmental Awareness Integration in the Curriculum...*

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The success of these methods indicates that there is significant potential for environmental education to be effectively integrated into the school curriculum. However, the study also highlighted that the extent to which these methods are applied varies across schools, depending on available resources, teacher expertise, and institutional commitment. This variation suggests that while some schools are making strides in implementing robust EE programs, others lag, emphasizing the need for more consistent, widespread adoption of EE practices across all private schools.

Despite the positive trends, several barriers hinder the seamless integration of environmental education. Limited resources, including inadequate teaching materials, lack of proper infrastructure, and insufficient funding, were identified as major constraints. These challenges are compounded by the absence of targeted professional development for teachers, many of whom do not have specialized training in environmental education. This lack of expertise restricts the ability of teachers to effectively deliver EE content and use interactive, engaging teaching methods that could deepen students' understanding.

Moreover, the study found that the crowded curriculum and time constraints were significant obstacles. Environmental education often competes with other academic priorities, leading to its relegation to a lower status within the educational framework. This is a common issue worldwide, where the inclusion of environmental topics in curricula is often perceived as secondary to core subjects. Addressing this issue requires a reevaluation of curricular priorities, with policymakers ensuring that EE is given the necessary space to flourish within the formal education system. One of the key strengths of this study was its focus on the impact of environmental education on students. The findings demonstrate that students exposed to environmental education exhibit increased awareness of environmental issues such as pollution, waste management, and climate change. More importantly, the study revealed that this knowledge translated into more positive attitudes and behaviors, with students showing a greater inclination to adopt sustainable practices, such as recycling, energy conservation, and tree planting. These results align with the principles of environmental literacy, which stress the importance of not only imparting knowledge but also fostering the skills and attitudes necessary for responsible environmental action (Roth, 1992). The findings suggest that the integration of EE can indeed influence the behavior of students tangibly. The establishment of environmental clubs and the involvement of students in practical environmental projects further enhanced this behavioral shift, providing students with real-world opportunities to apply their learning. These clubs fostered a sense of responsibility and ownership among students, demonstrating the power of experiential learning in shaping long-term environmental attitudes.

A key factor that emerged from the study was the importance of support from school administration and policy in facilitating the integration of environmental education. Schools that demonstrated a clear commitment to EE, both in terms of resources and policy, were more successful in embedding EE into their curricula. This highlights the crucial role that school leadership plays in creating an enabling environment for the successful delivery of environmental education. The Lahore High Court's recent mandate for schools to dedicate specific time to environmental education is a positive step in this direction, as it institutionalizes EE and ensures its sustained presence in the curriculum.

Additionally, external support from organizations such as WWF-Pakistan and WaterAid Pakistan has been invaluable in providing schools with resources, training, and guidance, helping them overcome some of the challenges related to resource constraints and teacher expertise. Such collaborations underscore the importance of partnerships between schools, government, and non-governmental organizations in promoting effective environmental education programs.

The findings from this study suggest several key policy implications. First, there is a clear need for national and local education policymakers to prioritize environmental education as part of the formal curriculum, ensuring that it receives the necessary resources and time allocation. This could include the development of dedicated EE curricula, teacher training programs, and the inclusion of environmental topics across multiple subjects. Schools should be provided with the necessary support, including financial resources, to effectively integrate EE into their teaching practices.

Second, it is recommended that environmental education be made an integral part of school culture. The involvement of students in extracurricular activities such as environmental clubs and projects should be encouraged, as these initiatives foster a deeper connection to environmental issues and empower students to take action. Encouraging a school-wide commitment to sustainability, through initiatives like waste reduction programs, green infrastructure, and sustainable energy practices, can further strengthen the integration of EE.

Lastly, the role of teachers in environmental education cannot be overstated. Teachers must receive continuous professional development and training in environmental education to enhance their knowledge and teaching capabilities. Collaboration with environmental organizations and NGOs can provide valuable resources and expertise to support teachers in delivering engaging and effective environmental education.

While private schools in Lahore have made significant strides in integrating environmental education into their curricula, there are still several challenges that need to be addressed to fully realize the potential of EE in shaping students' environmental literacy. By overcoming the barriers related to resources, teacher training, and curriculum constraints, and by fostering a supportive school culture and policy environment, the impact of environmental education can be significantly enhanced. This study has shown that with the right support, environmental education has the potential to not only increase students' knowledge but also instill in them the values and behaviors necessary for addressing the environmental challenges of the future.

For a sustainable and environmentally responsible future, environmental education must become a priority in all schools, ensuring that future generations are equipped with the knowledge, skills, and attitudes to protect and preserve our planet.