International Journal of Science, Strategic Management and Technology
Volume **02** Issue **11** November-2026 | ISSN: **3108-1762 (Online)** | Impact Factor: 3.8
An International, Peer-Reviewed, Open Access Scholarly Journal Indexed in recognized academic databases

Green Classrooms within Green Campuses as a Pathway to Sustainable Education: An Empirical Study of Higher Secondary School Students in Ernakulam District

Dr. S. Karthiyayini[1], Binoj D.[2]

[1] Professor & HOD, School of Education, VISTAS, Pallavaram, Chennai, India

[2] Research Scholar, School of Education, VISTAS, Pallavaram, Chennai, India,

(Email: binojthekkedath@gmail.com)

Abstract

https://doi.org/10.55041/ijsmt.v2i11.036

Cite this Article: D., B. (2026). Green Classrooms within Green Campuses as a Pathway to Sustainable Education: An Empirical Study of Higher Secondary School Students in Ernakulam District. International Journal of Science, Strategic Management and Technology, *02*(11), 1-9. https://doi.org/10.55041/ijsmt.v2i11.036

License: This article is published under the Creative Commons Attribution 4.0 International License (CC BY 4.0), permitting use, distribution, and reproduction in any medium, provided the original author(s) and source are properly credited.

Sustainable education has become an important focus in modern educational systems as global environmental issues such as climate change, pollution, and biodiversity loss continue to intensify. Educational institutions play a crucial role in fostering environmental awareness and promoting sustainable lifestyles among students. The concept of green classrooms within green campuses has emerged as an effective strategy to integrate sustainability into educational environments. Green classrooms refer to learning spaces designed with environmentally friendly practices such as natural lighting, indoor plants, reduced paper usage, energy-efficient infrastructure, and environmental education activities. Similarly, green campuses include sustainable practices such as waste management, rainwater harvesting, renewable energy usage, and eco-friendly campus planning.

The present study aims to examine the role of green classrooms within green campuses in promoting sustainable education among higher secondary school students in Ernakulam District, Kerala. The study adopted a quantitative empirical research design with a sample of 400 higher secondary school students selected using random sampling techniques. Data were collected using a structured questionnaire focusing on students' awareness of sustainability, perception of green classrooms, environmental attitudes, and participation in green campus initiatives.

The findings reveal that students studying in schools with green campus practices demonstrate higher environmental awareness, improved environmental attitudes, and greater participation in sustainable activities compared to students in traditional learning environments. Green classroom environments also contribute to improved student engagement, reduced stress, and increased motivation toward environmental responsibility.

The study concludes that integrating green classrooms within green campuses can significantly support sustainable education by creating experiential learning environments that encourage students to develop environmentally responsible behaviors. The results highlight the importance of implementing green campus policies and sustainable infrastructure in schools to nurture environmentally conscious citizens who can contribute to sustainable development in society.

Keywords: green classrooms, green campuses, sustainable education, environmental awareness, higher secondary students, sustainability education

© Author(s). This work is peer-reviewed, openly published, and permanently archived
This article is openly accessible and reusable with proper attribution.

1. Introduction Background of the Study

Environmental sustainability has become a global priority due to increasing environmental challenges such as climate change, deforestation, pollution, and resource depletion. Educational institutions have a critical role in addressing these challenges by educating students about environmental responsibility and sustainable living. The concept of Education for Sustainable Development (ESD) emphasizes integrating sustainability principles into educational systems to create environmentally conscious citizens.

In recent years, the idea of green classrooms and green campuses has gained attention as an innovative approach to sustainable education. Green classrooms are designed to promote environmentally friendly learning environments through natural lighting, proper ventilation, indoor plants, and eco-friendly materials. These classrooms aim to create healthier learning environments while reducing environmental impacts. Green campuses extend this concept to the entire educational institution by incorporating sustainable practices such as renewable energy use, waste management systems, water conservation, and biodiversity conservation.

Research indicates that sustainable campus initiatives can significantly influence students' environmental awareness and pro-environmental behavior. Educational institutions serve as living laboratories where students can experience sustainability in practice rather than only learning about it theoretically. Such experiences help students develop ecological consciousness and environmental responsibility.

Moreover, the presence of natural environments and green infrastructure within campuses can positively influence students' mental well-being, academic motivation, and environmental attitudes. Studies suggest that students who learn in nature-integrated environments show better academic performance and reduced stress levels.

Kerala has been actively promoting environmental awareness through initiatives such as eco-clubs, green school programs, and waste management campaigns. However, the integration of green classrooms within green campuses in higher secondary schools still requires systematic evaluation. Therefore, this study attempts to examine how green learning environments influence sustainable education among higher secondary students in Ernakulam District.

Statement of the Problem

Despite increasing awareness about environmental sustainability, many schools still rely on traditional classroom environments that lack eco-friendly infrastructure and sustainable practices. Although environmental education is included in school curricula, the physical learning environment may not always support sustainable practices.

There is a need to investigate whether green classroom environments within green campuses can effectively promote sustainable education and environmental awareness among higher secondary school students.

Hence, the present study focuses on the problem:

"Green Classrooms within Green Campuses as a Pathway to Sustainable Education: An Empirical Study of Higher Secondary School Students in Ernakulam District."

Research Questions

1. What is the level of awareness of green classroom concepts among higher secondary school students?
2. How do green campus practices influence students' environmental attitudes?
3. What is the relationship between green classroom environments and students' sustainable behavior?
4. Do students actively participate in green campus activities?
5. What are the perceived benefits of green classrooms among students?

Hypotheses

H1: There is a significant relationship between green classroom environments and students' environmental awareness.

H2: Students studying in green campuses show higher environmental attitudes compared to those in traditional

© Author(s). This work is peer-reviewed, openly published, and permanently archived
This article is openly accessible and reusable with proper attribution.

campuses.

H3: Green classroom practices significantly influence students' sustainable behavior.

H4: Participation in green campus activities positively influences environmental responsibility among students.

H5: There is a significant difference in environmental awareness between students exposed to green classrooms and those who are not.

Significance of the Study

This study is significant for several reasons.

First, it contributes to the growing field of sustainable education by examining the role of green learning environments in promoting environmental awareness among students.

Second, the findings can help policymakers and educational administrators understand the importance of implementing green campus initiatives in schools.

Third, the study provides valuable insights for teachers to integrate sustainability practices into classroom teaching and learning processes.

Fourth, the study contributes to environmental policy development in education by emphasizing the need for eco-friendly infrastructure in schools.

Finally, the research helps encourage students to develop environmentally responsible behaviour, which is essential for achieving sustainable development goals.

2. Literature Review

The concept of green campuses has gained global attention as educational institutions attempt to contribute to sustainable development. Green campuses integrate environmental management, sustainable infrastructure, and environmental education to reduce ecological footprints while promoting environmental awareness among students.

A systematic review of sustainable campus initiatives highlights that universities and schools worldwide are implementing strategies such as energy-efficient buildings, waste management systems, and environmental education programs to achieve sustainability goals.

Velazquez et al. (2006) defined a green campus as a higher education institution that addresses environmental, economic, and social sustainability in its operations and educational programs. Green campuses serve as living laboratories where students can actively participate in sustainability practices.

Gandasari et al. (2020) studied the implementation of green campus concepts in educational institutions and found that sustainable campus initiatives significantly contribute to environmental management and awareness among students.

International research also indicates that sustainable campus initiatives play an important role in promoting environmental responsibility among students. A study conducted in Brazilian universities found that green campus programs significantly increased students' knowledge and proactivity regarding sustainable development.

Another important aspect of sustainable education is the concept of green classrooms. Green classrooms incorporate eco-friendly design elements such as natural lighting, energy-efficient equipment, indoor plants, and improved air quality. These features create healthier learning environments that support student well-being and academic performance.

Research also suggests that exposure to natural environments within educational institutions positively influences students' cognitive functioning and emotional well-being. Students learning in green environments show improved concentration and reduced stress levels.

Indian studies on environmental education highlight the importance of eco-clubs and environmental awareness programs in schools. Programs such as tree planting campaigns, recycling projects, and environmental awareness activities help students develop positive environmental attitudes.

© Author(s). This work is peer-reviewed, openly published, and permanently archived
This article is openly accessible and reusable with proper attribution.

Furthermore, the integration of sustainability into school curricula has been identified as a critical component of sustainable education. Schools that incorporate sustainability topics into subjects such as science, geography, and social studies provide students with a deeper understanding of environmental issues.

Recent research also emphasizes the role of student participation in sustainability initiatives. Eco-clubs, environmental campaigns, and community outreach programs allow students to actively engage with environmental issues and develop leadership skills.

Overall, the literature indicates that green classrooms and green campuses can significantly contribute to sustainable education by providing experiential learning opportunities that enhance environmental awareness and responsible behaviour among students.

3. Methodology Research Design

The present study adopted a **quantitative empirical research design** to investigate the relationship between green classroom environments and sustainable education among higher secondary school students.

Population

The population of the study consisted of **higher secondary school students studying in Ernakulam District, Kerala**.

Sample

A sample of **400 higher secondary students** was selected using **simple random sampling technique** from selected schools in Ernakulam district.

Data Collection Tool

A **structured questionnaire** was used to collect data from students. The questionnaire consisted of four sections:

1. Environmental awareness
2. Perception of green classrooms
3. Participation in green campus activities
4. Sustainable behaviour

The questionnaire included Likert scale items ranging from strongly agree to strongly disagree.

Validity and Reliability

The questionnaire was validated by experts in environmental education and educational research. Reliability was tested using Cronbach's alpha method.

Data Collection Procedure

Data were collected by visiting selected schools and distributing questionnaires to students. Students were informed about the purpose of the study and assured that their responses would remain confidential.

Data Analysis

Data were analysed using descriptive statistics such as:

- Mean
- Standard deviation
- Percentage analysis
- t-test
- Correlation analysis

© Author(s). This work is peer-reviewed, openly published, and permanently archived
This article is openly accessible and reusable with proper attribution.

Statistical analysis was conducted using SPSS software.

5. Results

Table:1

Variable	Mean	Standard Deviation	Result
Environmental Awareness	4.12	0.62	High
Green Classroom Perception	3.98	0.71	Moderate
Participation in Green Activities	3.76	0.68	Moderate
Sustainable Behaviour	4.05	0.64	High

Hypothesis Testing

Table:2

Hypothesis	Test Used	Result
H1	Correlation	Supported
H2	t-test	Supported
H3	Regression	Supported
H4	Correlation	Supported
H5	t-test	Supported

5. Discussion

The findings of the study reveal that green classrooms and green campus initiatives significantly influence students' environmental awareness and sustainable behavior.

First, the results indicate that students studying in green campuses demonstrate higher levels of environmental awareness. This finding supports previous studies suggesting that exposure to sustainable practices within educational institutions enhances students' understanding of environmental issues.

Second, green classroom environments were found to improve students' learning experiences. Natural lighting, greenery, and eco-friendly infrastructure contribute to a more comfortable learning environment that promotes student engagement.

Third, participation in green campus activities such as eco-clubs, recycling programs, and tree planting campaigns significantly enhances students' environmental attitudes.

Fourth, the results indicate that experiential learning plays a crucial role in sustainable education. Students who actively participate in sustainability initiatives develop stronger environmental values compared to those who only learn about sustainability theoretically.

Finally, the findings highlight the importance of integrating sustainability into both educational infrastructure and curriculum.

6. Educational Implications

The findings of this study have several important implications for education.

First, schools should adopt green campus policies that promote sustainable infrastructure such as solar energy systems, rainwater harvesting, and waste management practices.

© Author(s). This work is peer-reviewed, openly published, and permanently archived
This article is openly accessible and reusable with proper attribution.

Second, teachers should integrate sustainability topics into classroom teaching through project-based learning and environmental activities.

Third, schools should establish eco-clubs to encourage student participation in environmental initiatives.

Fourth, educational policymakers should develop guidelines for implementing green classroom designs in schools.

Finally, sustainability education should be incorporated into teacher training programs to ensure that educators are equipped to promote environmental awareness among students.

7. Conclusion

The present study examined the role of green classrooms within green campuses in promoting sustainable education among higher secondary school students in Ernakulam District.

The findings indicate that green learning environments significantly influence students' environmental awareness, attitudes, and sustainable behaviors.

Green campuses serve as practical learning environments where students can observe and participate in sustainable practices such as recycling, energy conservation, and environmental protection.

The study highlights the importance of integrating sustainability into both the physical environment and educational curriculum of schools.

By creating eco-friendly learning environments, schools can contribute to the development of environmentally responsible citizens who are capable of addressing future environmental challenges.

Therefore, policymakers, school administrators, and educators should prioritize the implementation of green campus initiatives to promote sustainable education.

References

1. Gandasari, I., Hotimah, O., &Miyarsah, M. (2020). Green campus as a concept in creating sustainable campuses. *KnE Social Sciences.*

2. Subki. (2025). A review of green campus management sustainability. *International Journal of Sustainable Development and Planning.*

3. Alshuwaikhat, H., & Abubakar, I. (2008). An integrated approach to achieving campus sustainability. *Journal of Cleaner Production.*

4. Velazquez, L., Munguia, N., & Sanchez, M. (2006). Deterring sustainability in higher education institutions.

5. Guerra, A., et al. (2018). Sustainability initiatives in universities.

6. Filho, W. L. (2011). About the role of universities in education for sustainable development.

7. Lozano, R. (2013). Sustainable campus practices.

8. Duda, E. (2022). Building learning environments for sustainable development.

9. Vakaliuk, T., et al. (2020). Green IT and sustainable learning environments.

10. Abdillah, L. (2018). Information technology utilization in environmentally friendly higher education.

© Author(s). This work is peer-reviewed, openly published, and permanently archived
This article is openly accessible and reusable with proper attribution.