ISSN : 2962-9195 E-ISSN : 2963-8992

Journal of Educational Management Research
Vol. 04 No. 02 (2025) : 710-723
Available online at https://serambi.org/index.php/jemr

The Influence of the Green Campus Program on Students' Environmentally Friendly Behavior

Neza Navilla Putri*, Vandan Wiliyanti, Yetri
Universitas Islam Negeri Raden Intan Lampung, Indonesia
Email : vandanwiliyanti@radenintan.ac.id

DOI: https://doi.org/10.61987/jemr.v4i2.1014

Keywords:
Eco-Friendly Behavior, Green Campus, Sustainability

****Corresponding Author***

ABSTRACT

This study examines the impact of the green campus program at higher education institutions on students' environmentally friendly behavior and its contribution to sustainable development on campus and in surrounding communities. The green campus initiative addresses global environmental concerns by promoting responsible policies and behaviors. A quantitative approach was used, with data analysis conducted using Orange Data Mining software. The sample comprised 500 respondents from various study programs at the Faculty of Tarbiyah and Teacher Training, including environmental ambassador students at the State Islamic University of Raden Intan Lampung. Results showed positive perceptions of waste management facilities (mean = 4.04; SD = 0.9) and environmentally friendly transportation (mean = 3.68; SD = 1.03). However, pro-environmental behavior remained uneven, influenced by personal and institutional factors. The study recommends enhancing environmental education and support facilities to improve the program's effectiveness. These findings offer strategic insights for other institutions implementing green campus initiatives.

Article History:
Received: April 2025; Revised: May 2025; Accepted: June 2025

Please cite this article in APA style as:
Putri, N. N. P., Wiliyanti, V., Yetri. (2025). The Influence of the Green Campus Program on Students' Environmentally Friendly Behavior. *Journal of Educational Management Research*, *4*(2), 710-723.

INTRODUCTION

The Green Campus program has proven effective in increasing student knowledge and proactivity regarding sustainability issues. This outreach strategy explains the 27.7% increase in students' knowledge and awareness of sustainable development and encourages active involvement in environmentally friendly campus activities (Pereira et al., 2021; Fausey et al., 2024). The global environmental crisis demands serious attention from all levels of society, including the world of education. Campuses, as centers of learning, play a crucial role in fostering environmentally friendly behavior among students, who will become agents of future change.

According to Fuchs et al. (2020), Environmental awareness among students is crucial, considering they are the next generation and agents of change

in society. In today's global context, environmental issues are becoming increasingly pressing, and universities have a strategic position in developing pro-environmental behavior. However, research findings of Ribeiro et al. (2024) show that there is still less environmental awareness among students, such as littering and inefficient use of resources.

Through this program, students are not only given an understanding of the importance of protecting the environment, but are also actively involved in sustainability activities (Šorytė & Pakalniškienė, 2021). Based on a literature search, there has been little research comprehensively examining the impact of the Green Campus program on students' environmentally friendly behavior at UIN Raden Intan Lampung, particularly in the Faculty of Tarbiyah and Teacher Training. However, it is crucial to understand how this program influences student behavior and the factors that contribute to its success. There are several previous keywords that researchers found that refer to current research and are used by current researchers, as in Figure 1.

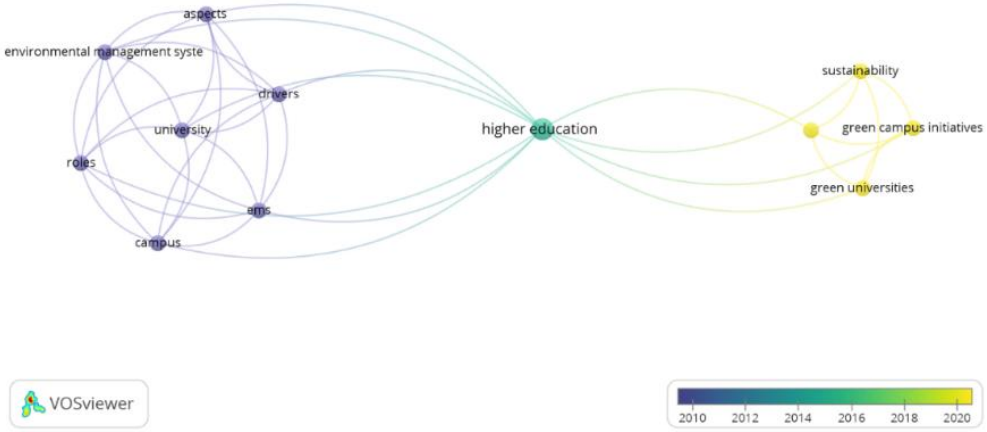

Figure 1. Some keywords that refer to the influence of the green campus program on students' environmentally friendly behavior by world researchers

Various initiatives have been undertaken to create sustainable campuses. UIN Raden Intan Lampung successfully achieved 9th place in the national green campus rankings. Despite this significant achievement, in-depth studies on the effectiveness of the Green Campus program in shaping student behavior are still limited. This study limits its scope to the influence of the Green Campus program on the environmentally friendly behavior of students at the Faculty of Tarbiyah and Teacher Training, which includes environmental awareness, waste management, energy efficiency, and sustainable mobility. The research questions raised are: (1) how does the Green Campus program influence students' environmentally friendly behavior in their daily lives, and (2) what factors support or hinder the success of this program?

In the Islamic context, the responsibility to protect the environment aligns with humanity's role as caliph. UIN Raden Intan Lampung has launched several programs since 2020, including the planting of 1,000 trees, the Environmental Management Awards (EMA), the establishment of a Green Corner, the TASARIL waste bank, composting training, and the planting of one million matoa trees. These initiatives demonstrate the university's commitment to developing a culture of sustainability (Solihin et al., 2021; Al-Dmour, 2023). The success of the Green Campus program depends on the active participation of students and support from campus policies and infrastructure. Students have great potential as agents of change, but challenges such as low participation and diverse perceptions remain. Therefore, a collaborative approach, ongoing education, and the integration of Islamic values into campus activities are necessary.

Through understanding the impact of this program, it is hoped that optimal strategies will emerge to increase students' environmental awareness and behaviour (Viana et al., 2025; Shange et al., 2025). This research also supports the achievement of the Sustainable Development Goals (SDGs), particularly goal 13 (climate action) and goal 15 (life on land) (Norazah & Norbayah, 2021). The focus on the Faculty of Tarbiyah and Teacher Training was chosen because this faculty has a strategic role in forming a generation of educators who are not only academically competent but also have environmental awareness.

This approach is expected to provide new insights into the effectiveness of the Green Campus program and encourage more inclusive and collaborative sustainability policies and programs across study programs. Results of initial interviews with eight study programsFaculty of Tarbiyah and Teacher Training, the Head of the Sustainable and Environmentally Aware Campus Development Team highlighted the program's positive contribution to the academic community's environmentally friendly practices. The strategy of integrating Islamic values and a sustainability-based curriculum is key to its success.

However, further research is needed to determine the program's long-term impact. Challenges such as cultural barriers and low participation need to be addressed through ongoing outreach and the use of environmentally friendly technologies. Thus, Green Campus has the potential to become a sustainability model for other universities in Indonesia. The urgency of this research lies in the need to fill the literature gap regarding the effectiveness of the Green Campus in shaping environmentally friendly behavior in students. Although UIN Raden Intan Lampung has implemented various green initiatives, active student participation remains a challenge. This study is expected to provide strategic recommendations and serve as a reference for developing sustainability policies on campus, as well as supporting the achievement of the SDGs through an approach that integrates Islamic values and sustainability practices.

RESEARCH METHOD

This research uses a quantitative approach, namely a research approach that uses mathematical and statistical techniques to describe and analyze the phenomena or symptoms being studied (Lim, 2024). This method is often cited as the core of the scientific approach because of its ability to provide objective and measurable results by Mishra et al. (2021) to analyze quantitative data, this study will use Orange Data Mining software to perform descriptive statistical analysis and data visualization.

The population in this study were active students from the 2021 to 2023 intake from eight study programs at the Faculty of Tarbiyah and Teacher Training, UIN Raden Intan Lampung, namely: (1) English Language Education, (2) Arabic Language Education, (3) Physics Education, (4) Biology Education, (5) Mathematics Education, (6) Elementary Madrasah Teacher Education, (7) Islamic Education Management, and (8) Information Systems. In addition, the population also includes students who are members of the UIN Raden Intan Lampung environmental ambassadors, with various data sources obtained from documents such as Scopus, Sinta Journal, Taylor and Francis Online, ScienceDirect, and Google Scholar.

Determination of the number of samples in this study was carried out using the Slovin formula, as explained by *Santoso (2023) :*

$$n = \frac{N}{1 + Ne^2}$$

Information:
n = Sample size
N = Total Population
e = Error tolerance
There are two provisions in the Slovin formula for determining error tolerance, namely:

1. The value of e = 5% (0.5) if the population is large.
2. The value of e = 10% (0.1) if the population is small.

Data were obtained by distributing questionnaires to students from eight study programs, using a 5-point Likert scale with the aim of measuring to assess students' perceptions of awareness and participation in the green campus program.

Table 1. Likert Scale

Scale	Score	Scale Span
Strongly agree	5	4.20-5.00
Agree	4	3.40-4.19
Doubtful	3	2.60-3.39
Don't agree	2	1.80-2.59
Strongly Disagree	1	1.00-1.79

To ensure data validity, researchers employed triangulation techniques by comparing information from various sources and examining the collected data. This demonstrated the reliability and veracity of the data obtained.

RESULT AND DISCUSSION

Result

Pro-environmental behavior refers to individual actions that directly or indirectly contribute to environmental preservation and reduce negative impacts on ecosystems. According to Steg, a pro-environmental behavior encompasses all activities undertaken to protect and improve environmental quality, such as waste management, energy conservation, and support for environmental programs. Pro-environmental behavior can also be understood as a form of individual responsibility for the sustainability of the earth, encompassing mindsets, attitudes, and habits consistent with sustainability principles.

The Green Campus program plays a crucial role in shaping students' habits and attitudes toward the environment. Through various initiatives such as waste management, energy conservation, reforestation, and educational campaigns, the program encourages students to understand and practice environmentally friendly behaviors in their daily lives. Cortese stated that universities, as educational institutions, are responsible not only for transferring knowledge but also for shaping students' personalities and character. The Green Campus program provides hands-on experiences that strengthen environmental awareness and encourage students to become agents of social change.

Based on the Slovin formula, the minimum number of respondents was set at 370. However, to anticipate errors and improve accuracy, the number of respondents was increased to 500. The demographic variation of respondents by institution reflects the diversity of students at the Faculty of Tarbiyah and Teacher Training, as shown in the following figure:

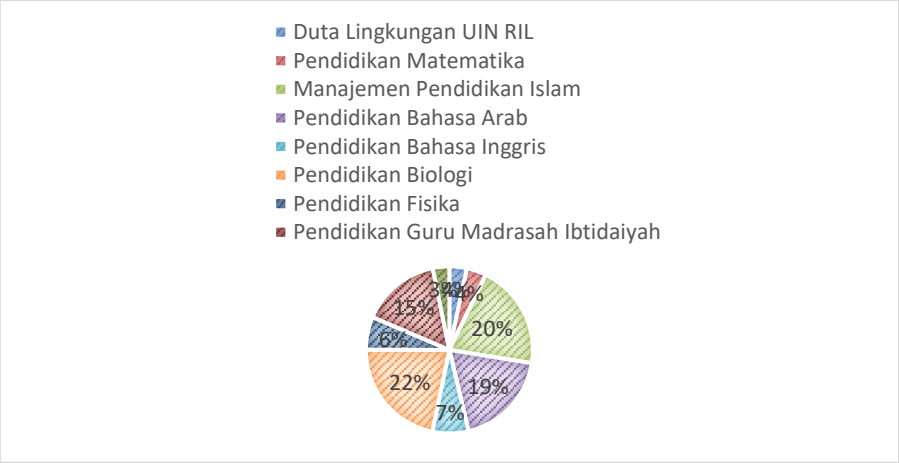

Figure 2. Respondent data information based on agency

The researchers obtained the above data from distributing questionnaires to all predetermined respondents. Furthermore, respondent characteristics included gender variation, reflecting the demographic diversity of the study participants. This information is crucial for understanding the context of student perceptions and behaviors toward the green campus program and ensuring data representativeness, as shown in the following Figure:

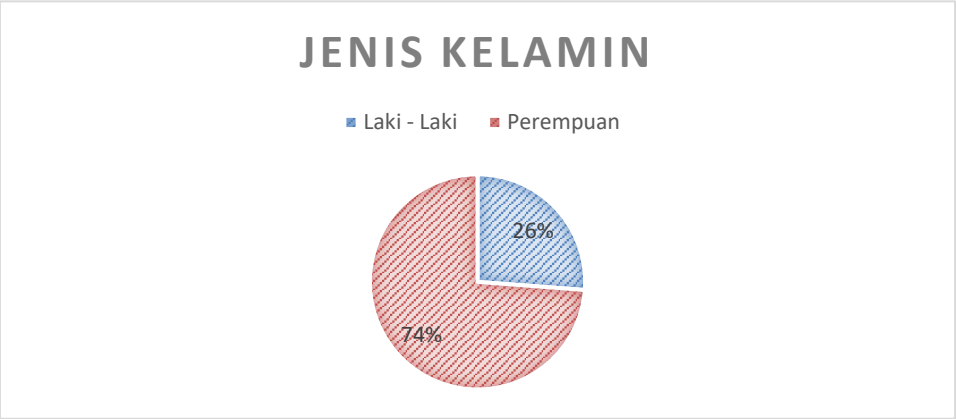

Figure 3. Respondent data information based on gender

One of the indicators in variable X related to the "green campus program" shows an average score of 4.04 with a data distribution (standard deviation) of 0.91. The data shows that the majority of respondents chose the numbers 4 (Agree) and 5 (Strongly Agree), with the highest frequency being at the value of 4. This indicates a strong positive perception of campus waste management facilities, such as separate trash bins, waste banks, or recycling systems. The first figure shows the distribution of student responses to the statement: **"The campus provides adequate facilities for waste management, such as a functioning waste bank."**

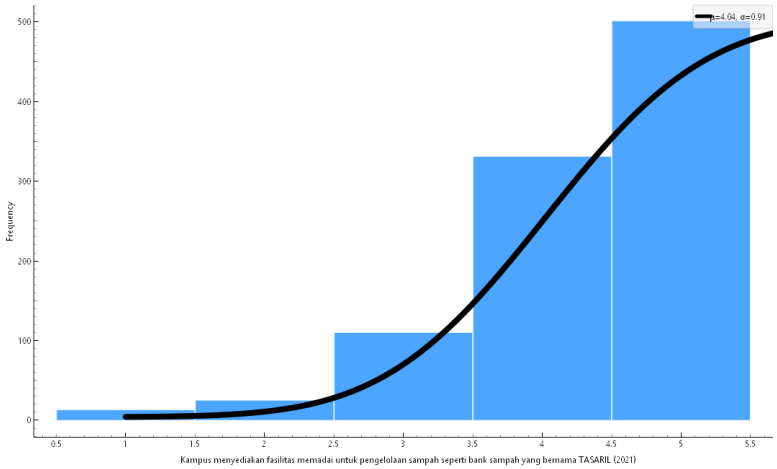

Figure 4. The results of data processing on the questionnaire

The distribution of the data is approximately normal, with a slight right skew, as a small proportion of respondents chose 1–2. This means that although the majority of students were satisfied, a small proportion were dissatisfied or unaware of the facility's existence. The standard deviation of 0.91 is relatively small, indicating that the distribution of responses is quite consistent and does not deviate significantly from the average. This reflects that students' perceptions of campus waste management facilities are relatively homogeneous and stable. These results strengthen the argument that the green campus program at UIN Raden Intan Lampung has had a significant impact on providing environmental infrastructure.

However, these results also indicate the need for more widespread outreach to ensure all students are aware of the available facilities, evaluation of the quality and availability of facilities in each faculty, and training on the use of recycling facilities. By improving the quality and awareness of these facilities, the effectiveness of the green campus program will be more evenly distributed across campus.

Based on the results of a survey conducted by researchers on the Y variable "environmentally friendly behavior" with the statement "I prefer to use environmentally friendly transportation such as walking, cycling, or public transportation," the average recorded was 3.68 with a standard deviation of 1.03. This shows that most respondents are more likely to choose environmentally friendly transportation, with the highest frequency being in the value category 4, which indicates that the majority of students choose to use environmentally friendly transportation, but not consistently on every occasion. A small number of respondents are in the lower categories (values 1 and 2), indicating that there are also students who still choose private transportation or vehicles that are not.Environmentally friendly.

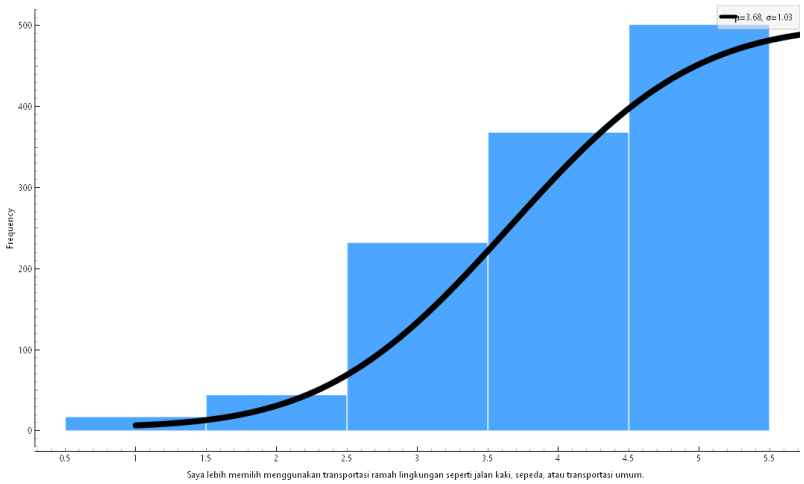

Figure 5. The results of data processing on the questionnaire

The distribution curve appears normal with a wider spread than the previous graph, as evidenced by the larger standard deviation (1.03). This indicates that student attitudes vary more widely on this indicator. Some students may choose private transportation for reasons of convenience, distance, or the availability of public facilities. Meanwhile, others are accustomed to walking or cycling on campus. These results indicate that awareness-raising efforts have begun to be successful, but there is still a need to improve the accessibility and convenience of public transportation around campus, provide facilities such as bike lanes and bicycle parking, and promote awareness campaigns about the benefits of environmentally friendly transportation for health and the climate. If the campus can bridge external factors (facilities) and internal factors (student awareness), then behavioral change towards green transportation will be easier to achieve.

Discussion

Although numerous studies have examined the impact of green campus programs on various aspects, such as campus environmental quality and student perceptions, there is limited research specifically measuring the program's influence on changes in students' environmentally friendly behavior. This study aims to fill this gap by in-depth analyzing the influence of UIN Raden Intan Lampung's green campus program on students' environmentally friendly behavior. Thus, this research is expected to provide a significant empirical contribution to the development of more effective green campus programs in the future.

The results of this study support the statement by Pereira Ribeiro et al. (2021), which states that green campus initiatives are able to increase students' understanding and active involvement in sustainability issues. The implemented outreach approach significantly increased students' understanding and awareness of sustainable development by 27.7% and stimulated their participation in environmentally friendly activities on campus. Field findings indicate that a significant number of students still do not fully understand or recognize the existence of sustainability programs on campus. Therefore, a more comprehensive and integrated outreach strategy is needed, both through classroom learning and extracurricular activities (Kruger et al., 2020). Developing sustainability outreach on campus requires a combination of education, active participation, collaborative activities, and supportive spaces and policies. Structured efforts involving the entire campus community will strengthen the culture and practices of sustainability on an ongoing basis.

From the perspective of Islamic education management, the management of the green campus program can be analyzed through the basic principles of

Islamic management, such as tadbir (planning), tanzhim (organizing), tawjih (direction), and taqwim (supervision/evaluation) (Sabrifha et al., 2023). These four functions play an important role in designing and implementing sustainability policies based on Islamic values. Waste management and recycling are vital aspects of creating an environmentally conscious and sustainable campus. Numerous studies have explored approaches, challenges, and breakthroughs in waste management in various contexts, including developed and developing countries.

Through measures such as providing separate waste bins, providing student education, and providing recycling facilities, campuses can reduce the negative impact of waste on the environment. While implementation is not without challenges, policy support and collective awareness among the academic community enable more effective waste management and provide tangible benefits to the campus environment and surrounding communities (Yang et al., 2020)

The high data distribution results indicate that most respondents acknowledge the campus's efforts to provide waste management facilities, such as waste banks or structured recycling systems. While predominantly positive, low ratings from a small number of respondents indicate a potential gap between expectations and the reality of program implementation. This situation opens up room for evaluation of the quality and availability of facilities, while also encouraging increased education on the importance of sustainable waste management. In the future, developing more comprehensive waste management facilities and strengthening educational programs are crucial steps to encourage active involvement of the entire campus community.

Education and outreach to students and staff are crucial for building awareness and active participation in waste sorting and recycling. However, voluntary approaches alone are ineffective; additional incentives and policies are needed to drive real behavior change. The use of technologies such as sensors, IoT-based monitoring systems, and waste processing innovations (e.g., shredders, organic composters) can increase the efficiency of managing and monitoring recycled waste on campus (Rimantho et al., 2022). The establishment of a dedicated unit like the TPKBBL plays a crucial role in coordinating waste reduction programs, monitoring them, and reporting their results. This approach also involves decentralized management and cross-unit collaboration on campus.

Several factors may influence their choices, such as the distance between the campus and the residence, convenience, and the availability of efficient public transportation. The frequency distribution, which shows a concentration of values 4 and 3, also indicates that although students choose environmentally

friendly transportation, they do not always do so every day or in all situations. It is important to note that the standard deviation of 1.03 indicates variation in student behavior, which could be caused by personal preferences, difficulty in access, or other external factors. Therefore, despite the positive trend in the use of environmentally friendly transportation, campuses or related institutions can further optimize public transportation facilities, bicycle lanes, and pedestrian paths to further support the wider adoption of environmentally friendly transportation (Rehman et al., 2023). To increase participation, campuses can also provide more educational programs and campaigns supporting the importance of switching to more environmentally friendly transportation.

Implementing environmentally friendly behavior on campus through the use of environmentally friendly transportation is an important step to reduce pollution, carbon emissions, and create a healthy and sustainable campus environment (Pujiati et al., 2021)Key challenges include limited facilities, a culture of private vehicle use, and the need for consistent policies and incentives to encourage behavioral change. The success of the program depends heavily on collaboration between the campus, government, and community, as well as the existence of supportive policies and ongoing evaluation (Bethary et al., 2022). These various efforts implemented can be effective with great hope of having a positive impact on reducing emissions, forming sustainable habits, and creating a healthier and more comfortable campus environment (Bethary et al., 2022; Pazhuhan et al., 2022).

The results of this study indicate that an effective managerial approach can strengthen the success of the green campus program. In the context of Islamic education management, managerial implications include the importance of developing sustainability policies based on Islamic values such as responsibility and justice. Faculty and study program leaders can implement an Islamic transformational leadership style, where lecturers and educational staff become role models in an environmentally friendly lifestyle. The curriculum can be modified to include environmental education materials based on Islamic values, including interpretations of verses on nature conservation and environmental jurisprudence.

Furthermore, active student involvement through intra-campus organizations and environmental ambassadors needs to be structurally facilitated. Program evaluation is conducted not only through quantitative indicators but also through reflection on the spiritual, social, and ecological values that have been achieved. Thus, Islamic education management plays a strategic role in aligning campus academic and operational policies with a holistic vision of sustainability. This study provides an empirical contribution to the importance of education and physical facilities in encouraging changes in

student behavior. These results are also useful as input for campus policies to improve the effectiveness of sustainability programs. The persistence of students who have not fully adopted environmentally friendly behavior indicates the need for additional policies such as incentives, integration into the curriculum, and the provision of better transportation infrastructure. The involvement of units such as the TPKBBL is also crucial in coordinating program management and evaluation.

CONCLUSION

The green campus program has had a positive impact on students' environmental awareness, as evidenced by increased awareness of environmental issues, participation in greening activities, and waste management. The majority of students assessed the waste management facilities on campus as adequate and expressed interest in environmentally friendly transportation such as walking, cycling, or using public transportation. However, student participation is not evenly distributed. Several inhibiting factors, such as inadequate facilities, low awareness, and cultural barriers, still need to be addressed. To increase the program's effectiveness, it is necessary to strengthen outreach, integrate environmental issues into the curriculum, and improve green infrastructure.

This research also contributes to the development of Islamic Education Management through the integration of Islamic values in environmental management, the implementation of Islamic management, and the use of technologies such as Orange Data Mining. Respondents also assessed the need for evaluation and development of sustainability programs such as energy conservation and plastic recycling, as well as collaboration with local communities and the use of environmental technology. Student-based evaluations need to be complemented by longitudinal research and campus policy analysis to ensure the green campus program has a significant impact on the campus environment and the wider community.

REFERENCES

Al-Dmour, H. (2023). Green-smart university campuses: The mediating role of student engagement in enhancing corporate image. *SAGE Open, 13*(4). https://doi.org/10.1177/21582440231219591

Andriani, D., Abdulkarim, A., & Insani, N. N. (2023). Implementasi program Kampus Mengajar dalam pembentukan karakter tanggung jawab mahasiswa Fakultas Pendidikan Ilmu Pengetahuan Sosial Universitas Pendidikan Indonesia. *Jurnal Ilmiah Mimbar Demokrasi, 23*(1), 273–284. https://doi.org/10.21009/jimd.v23i1.37963

Bethary, R. T., Budiman, A., Intari, D. E., & Ramdhan, D. (2022). Evaluation of the green transportation concept in the Sultan Ageng Tirtayasa University campus. *IOP Conference Series: Earth and Environmental Science, 1000*(1), 012015. https://doi.org/10.1088/1755-1315/1000/1/012015

Fausey, K., & Ambrose, R. (2024). Ecosystem service values support conservation and sustainable land development: Perspectives from four University of California campuses. *Ecological Engineering, 208*, 107379. https://doi.org/10.1016/j.ecoleng.2024.107379

Fuchs, P., & Andrade Guerra, J. B. S. O. de A. (2020). Promoting sustainable development in higher education institutions: The use of the balanced scorecard as a strategic management system in support of green marketing. *International Journal of Sustainability in Higher Education, 21*(7), 1477–1505. https://doi.org/10.1108/IJSHE-02-2020-0079

Heriyanto, H. (2020). Thematic analysis as a method for analyzing data for qualitative research. *Anuva, 2*(3), 317. https://doi.org/10.14710/anuva.2.3.317-324

Ishak, A., & Afif, M. (2020). Orange software usage in data mining classification method on the dataset lenses. *IOP Conference Series: Materials Science and Engineering, 1003*(1). https://doi.org/10.1088/1757-899X/1003/1/012113

Johnson, R. B., & Teddlie, C. (2021). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in social and behavioral sciences*. https://www.researchgate.net/publication/365368935

Kruger, T. M., & Aldrich, S. P. (2020). College students' understanding of social justice as sustainability. *International Journal of Sustainability in Higher Education, 21*(3), 513–530. https://doi.org/10.1108/IJSHE-06-2021-0196

Lestari, N. (2021). Waste management design for green campus. *JTEV (Journal of Electrical and Vocational Engineering), 5*(1.1), 73. https://doi.org/10.24036/jtev.v5i1.1.106150

Likert scale in social sciences research: Problems and difficulties. (2022). *FWU Journal of Social Sciences*, 89–101. https://doi.org/10.51709/19951272/Winter2022/7

Lim, W. M. (2024). What is quantitative research? An overview and guidelines. *Australasian Marketing Journal*. https://doi.org/10.1177/14413582241264622

Mishra, P., Pandey, C., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2021). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia, 22*(1), 67. https://doi.org/10.4103/aca.ACA_157_18

Norazah, M. S., & Norbayah, M. S. (2021). Campus sustainability: Does student engagement with eco-campus environmental activities and green initiatives matter? 45–59. https://doi.org/10.1007/978-3-319-26734-0_4

Nu'man, T. M., & Noviati, N. P. (2021). Environmentally conscious behavior from the perspective of the theory of planned behavior: An analysis of the intention to use plastic bags and straws among college students. *Ecopsy Journal, 8*(2), 165. https://doi.org/10.20527/ecopsy.2021.10.016

Pazhuhan, M., Soltani, A., Ghadami, M., Shahraki, S. Z., & Salvati, L. (2022). Environmentally friendly behaviors and commuting patterns among tertiary students: The case of University of Tehran, Iran. *Environment, Development and Sustainability, 24*(5), 7435–7454. https://doi.org/10.1007/s10668-022-02266-x

Ribeiro, J& Guerra, J. B. (2021). Green campus initiatives as sustainable development dissemination at higher education institutions: Students' perceptions. *Journal of Cleaner Production, 312*, 127671. https://doi.org/10.1016/j.jclepro.2021.127671

Pujiati, A., Bowo, P. A., & Putri, R. N. I. (2021). Strategy to actualize green campuses through sustainable transportation. *Economics Development Analysis Journal, 10*(2), 143–152. https://doi.org/10.15294/edaj.v10i2.43974

Rehman, F. U., Islam, M. D. M., & Miao, Q. (2023). Environmental sustainability via green transportation: A case of the top 10 energy transition nations. *Transport Policy, 137*, 32–44. https://doi.org/10.1016/j.tranpol.2023.04.013

Ribeiro, H., Santana, K. V. de S., & Oliver, S. L. (2024). Natural environments in university campuses and students' well-being. *International Journal of Environmental Research and Public Health, 21*(4), 413. https://doi.org/10.3390/ijerph21040413

Rimantho, D., & Sandi, A. (2022). Solid waste management strategy to support green campus sustainability: An AHP approach. *EnviroScienteae, 18*(1), 111. https://doi.org/10.20527/es.v18i1.13000

Sabrifha, E., Zatrahadi, M. F., & Istiqomah, I. (2023). Application of Islamic educational management principles in developing Islamic school curriculum: Using a scientific literature review. *EDUCATIO Journal: Indonesian Education Journal, 9*(1), 170. https://doi.org/10.29210/1202322932

Santoso, A. (2023). Slovin's formula: Panacea sample size problem? *Suksma: Journal of Psychology, Sanata Dharma University, 4*(2), 24–43. https://doi.org/10.24071/suksma.v4i2.6434

Selim, M. (2021). Shura or consultative decision making and its effectiveness in establishing unity, strength, and commitment. *2021 International Conference on Sustainable Islamic Business and Finance*, 90–93. https://doi.org/10.1109/IEEECONF53626.2021.9686349

Shange, H. S., Zogli, L.-K. J., & Bongani, I. (2025). Green campus initiatives and strategies for sustainability in higher education. *Transformation in Higher Education, 10*. https://doi.org/10.4102/the.v10i0.364

Smyth, D. P., Fredeen, A. L., & Booth, A. L. (2020). Reducing solid waste in higher education: The first step towards 'greening' a university campus. *Resources, Conservation and Recycling, 54*(11), 1007–1016. https://doi.org/10.1016/j.resconrec.2020.02.008

Solihin, M. I., & Rizon, M. (2021). Machine learning calibration for near infrared spectroscopy data: A visual programming approach (pp. 577–590). https://doi.org/10.1007/978-981-15-5281-6_40

Šorytė, D., & Pakalniškienė, V. (2021). Why it is important to protect the environment: Reasons given by children. *International Research in Geographical and Environmental Education, 28*(3), 228–241. https://doi.org/10.1080/10382046.2021.1582771

Thurmond, V. A. (2022). The point of triangulation. *Journal of Nursing Scholarship, 33*(3), 253–258. https://doi.org/10.1111/j.1547-5069.2001.00253.x

Tolley, R. (1996). Green campuses: Cutting the environmental costs of commuting. *Journal of Transport Geography, 4*(3), 213–217. https://doi.org/10.1016/0966-6923(96)00022-1

Viana, P., Bastos, J., Silva, D., Cabral, A., Ledoux, A., & Mesquita, E. (2025). Mapping the environmental footprint: Tracing ceramic tile production's impact on sustainable goals. *Journal of Building Pathology and Rehabilitation, 10*(1), 2. https://doi.org/10.1007/s41024-024-00510-7

Wu, D. W. (2024). A student-participation approach to achieving sustainability on campus. *SpringerPlus, 4*(S2), P8. https://doi.org/10.1186/2193-1801-4-S2-P8

Yang, H., Ma, M., Thompson, J. R., & Flower, R. J. (2020). Waste management, informal recycling, environmental pollution, and public health. *Journal of Epidemiology and Community Health, 72*(3), 237–243. https://doi.org/10.1136/jech-2021-208597