Behavioral Effects in Knowledge and Awareness Attribute for the Green Campus Management (GCM)

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Abstract: Green Campus Management (GCM) is a strategic approach for higher education institutions to achieve sustainability goals. A critical attribute of GCM's success is its ability to foster pro-environmental behaviors among campus stakeholders through enhanced knowledge and awareness. This literature review synthesizes research from 2020 to 2025 to examine the behavioral effects of the knowledge and awareness attribute within GCM frameworks. As illustrated in research, key studies reveal that environmental attitudes, behavioral intentions, and personal norms often mediate this relationship. The review also highlights that positive stakeholder perceptions and institutional commitment to green paradigms are crucial for inserting a sustainable culture. Conversely, a lack of proper planning can undermine these behavioral effects. In conclusion, knowledge and awareness are not merely informational attributes but are dynamic drivers of behavioral change within GCM. The effectiveness is maximized when integrated with supportive institutional systems that motivate and enable the campus community to act upon their knowledge, thereby realizing the overarching objectives of campus sustainability. This research contributes to the growing discourse on sustainable development in higher education institutions by offering strategic insights for policymakers and campus administrators to foster a culture of sustainability through behavioral change.

Keywords: Behavioral Effects, Knowledge and Awareness, Attributes, Green Campus Management

Introduction

This article examines the behavioral effects associated with knowledge and awareness attributes in the context of Green Campus Management (GCM). Green Campus Management (GCM) has become increasingly important in higher education

institutions worldwide. Its goal is to promote sustainability by integrating eco-friendly practices into campus operations and student behavior. One key factor in GCM's effectiveness is understanding how knowledge and awareness influence individuals' adoption of sustainable practices on campus. The article conducts a literature review, focusing on the relationship between knowledge and awareness, and how behavioral effects of the students, staff and faculty within the educational institutions. The findings suggest the transformative potential of environmental education in improving students' understanding of sustainability issues and green campus management initiatives. The review explores how attitudes and social norms play mediating roles in the interplay between the attributes of knowledge and awareness. The findings suggest that educational programs and awareness campaigns are pivotal in fostering a more profound commitment to sustainability, ultimately contributing to the successful implementation of GCM strategies and the creation of a greener, more sustainable campus environment.

Method

The data sources are from an article related to the behavioral effect and the Knowledge and Awareness for the Attribute for the Green Campus Management (GCM). The articles were searched using the Google Scholar search engine. Articles ranging from years 2020 to 2025 are used. Twelve articles were chosen most related to topics being discussed. Analyzing multiple articles ensures a well-rounded understanding of the topic. With different perspectives from the studies, the review covers various aspects of behavioral aspects and green campus initiatives, offering a holistic view of how these elements are interconnected. Sustainability is a broad and evolving topic. By reviewing articles, we can identify common trends, emerging practices, and the latest academic discourse across different regions and institutions. This helps to build a stronger case for how these practices are being adopted globally. In the articles themselves, most of the articles being reviewed adopt a mixed-methods approach, combining quantitative surveys and qualitative interviews to explore the behavioral effects of knowledge and awareness attributes in GCM. The survey instrument assesses participants' levels of knowledge, awareness, attitudes, and behaviors related to sustainability on campus, while semi-structured interviews provide deeper insights into the underlying factors influencing individual behaviors. A sample of students, faculty, and staff from diverse departments and campus roles is recruited to ensure a comprehensive understanding of the topic.

Literature Review

The primary objectives of the studies are to assess the influence on behavioral aspectson knowledge within university settings. Additionally, the research aims to investigate the mediating role of attitudes and intentions in translating behaviors. It also seeks to evaluate the effectiveness of green campus initiatives in promoting

sustainability awareness and engagement among students and staff to identify the factors that contribute to the success or failure of sustainability actions on campuses.

A central pillar of successful Green Campus Management (GCM) across all campus stakeholders, including students, academics, and staff. Research from 2020 to 2025 consistently demonstrates that knowledge and awareness are foundational attributes that directly and indirectly shape these behaviors. The literature reveals that b knowledge serves as a critical antecedent, which, when effectively disseminated and internalized, can significantly enhance sustainable practices, improve environmental performance, and foster a pervasive culture of sustainability within higher education institutions.

The direct link between environmental knowledge and pro-environmental behavior is well-established. Fawehinmi et al. (2020) found that the green behavior of academics is significantly bolstered by their level of environmental knowledge. This suggests that formal organizational systems can amplify the behavioral effects of knowledge. Similarly, among students, Wu et al. (2022) demonstrated that environmental knowledge is a key predictor of improved behavior, operating alongside personal norms and the constructs of the Theory of Planned Behavior. This indicates that knowledge not only provides the "how-to" but also interacts with moral and perceptual factors to drive action.

However, the mechanism through which knowledge translates into action is often complex and mediated by other psychological variables. Liu et al. (2020) provided a nuanced model showing that environmental knowledge does not automatically lead to behaviors; instead, its effect is channeled through the formation of positive environmental attitudes and specific behavioral intentions. This highlights the importance of GCM initiatives that go beyond mere information dissemination to actively shape attitudes and motivate intentional action.

The effectiveness of GCM in building awareness and shaping behavior is also reflected in stakeholder perceptions and the strategic paradigms adopted by institutions. Ribeiro et al. (2021) reported positive student perceptions of green campus initiatives, linking them directly to the broader dissemination of sustainable development goals. When students are aware of and engaged with these initiatives, their pro-environmental behavior is more likely to be sustained. Anthony Jnr (2021) further reinforced this by comparing green campus paradigms, concluding that their adoption is a strategic pathway to enhanced sustainability attainment. This top-down, paradigm-level commitment is essential for creating an environment where knowledge and awareness can flourish.

A lack of effective planning and implementation can undermine these behavioral effects. Amaral et al. (2021) offered a crucial counterpoint by analyzing unsuccessful sustainability actions, reminding us that knowledge and awareness initiatives can fail without proper contextualization and operational support. This underscores that the mere presence of information is insufficient; it must be coupled with well-executed and well-supported programs to effect behavioral change.

More recent studies continue to affirm this trend. An integrated framework for young consumers (Jahari et al., 2022) and targeted initiatives for canteen traders (Ramos & Yunanto, 2023) show that tailored approaches to enhancing knowledge and awareness are effective across diverse campus groups. As Zhu et al. (2020) argued, the green campus serves as a holistic development mode to realize sustainability goals, a process fundamentally dependent on the pro-environmental behaviors of its informed and aware community.

Behavioral effect

Knowledge and awareness significantly influence behavioral outcomes within green campus management. Green behavior among academics is mediated by environmental knowledge, indicating that informed individuals are more likely to adopt sustainable practices (Fawehinmi et al., 2020).Comparative studies further highlight that behavioral participation by staff and students is essential for achieving sustainability goals, and this participation is strongly linked to their environmental understanding (Anthony Jnr, 2021).Conversely, insufficient awareness can lead to behavioral barriers, such as lack of commitment and stakeholder engagement, which undermine sustainability efforts (Amaral et al., 2021).

Environmental knowledge combined with personal norms predicts behaviors like recycling and proper disposal, supporting the theory of planned behavior (Wu et al., 2022).Awareness also activates norm-based behaviors, influencing sustainable consumption and lifestyle choices among young consumers (Jahari et al., 2022). Furthermore, perceived behavioral control, shaped by knowledge and awareness, affects decisions (Ramos & Yunanto, 2023). Global warming awareness and environmental concern positively correlate with pro-environmental behaviors, reinforcing the role of cognitive understanding in shaping sustainable actions (Yilmaz & Can, 2020).

Articles	Behavioral Effect	Description
Anwar, N., Mahmood, N. H. N., Yusliza, M. Y., Ramayah, T., Faezah, J. N., & Khalid, W. (2020). Journal of Cleaner Production, 256, 120401.	Organizational Citizenship Behavior (OCBE)	Voluntary pro-environmental actions beyond formal roles, influenced by environmental knowledge.
Fawehinmi, O., Yusliza, M. Y., Mohamad, Z., Noor Faezah, J., & Muhammad, Z. (2020). International Journal of Manpower, 41(7), 879–900.	Green Behavior of Academics	Mediated by environmental knowledge; informed individuals adopt sustainable practices.
Liu, P., Teng, M., & Han, C. (2020). Science of the Total Environment, 728, 138126.	Environmental Attitudes & Intentions	Knowledge fosters attitudes, which shape behavioral intentions toward sustainability.
Ribeiro, J. M. P., Hoeckesfeld, L.,	Student Proactivity &	Awareness from green campus

Dal Magro, C. B., Favretto, J., Barichello, R., Lenzi, F. C., ... & De Andrade, J. B. S. O. (2021). Journal of Cleaner Production, 312, 127671.	Engagement	initiatives drives active participation in sustainability programs.
Anthony Jnr, B. (2021). Journal of Science and Technology Policy Management, 12(1), 117–148.	Behavioral Participation	Staff and student involvement linked to environmental understanding and concern.
Wu, L., Zhu, Y., & Zhai, J. (2022). Frontiers in Psychology, 12, 771723.	Waste Management Behavior	Environmental knowledge and personal norms predict recycling and disposal behaviors.
Jahari, S. A., Hass, A., Idris, I. B., & Joseph, M. (2022). Journal of Consumer Marketing, 39(4), 333–344.	Norm Activation	Awareness activates personal norms, influencing sustainable consumption and lifestyle choices.
Ramos, Y., & Yunanto, T. A. R. (2023). Towards a Sustainable Campus: Study of Pro-Environmental Behavior of Canteen Traders at XYZ Private University.	Perceived Behavioral Control	Awareness and perceived ability affect energy conservation and waste reduction behaviors.
Yilmaz, V., & Can, Y. (2020). Environment, Development & Sustainability, 22(7).	Climate Change Awareness & Concern	Global warming awareness positively correlates with pro-environmental behaviors.

Table 1: The analytical review showing the effects of behavioral aspects discussed in the article

Results

The analysis of the selected studies reveals a strong interconnection between knowledge, awareness, and behavioral attributes in achieving effective green campus management. Across the literature, environmental knowledge emerges as a critical driver of pro-environmental behavior. Similarly, green behavior among academics is significantly mediated by environmental knowledge, indicating that institutional practices like Green HRM require knowledge dissemination to translate into actual behavioral change (Fawehinmi et al., 2020).

Awareness plays an equally important role by shaping environmental attitudes and behavioral intentions, which act as precursors to sustainable actions (Liu et al., 2020). Green campus initiatives that raise awareness have been found to increase student proactivity and engagement, leading to higher participation in sustainability programs (Ribeiro et al., 2021). Comparative studies further emphasize that behavioral participation by staff and students is essential for sustainability attainment, and this participation is strongly linked to their environmental understanding and concern (Anthony Jnr, 2021).

Behavioral attributes identified across the studies include waste management behavior, norm activation, and perceived behavioral control, all of which are influenced

by knowledge and awareness. For example, environmental knowledge combined with personal norms predicts recycling and proper waste disposal behaviors (Wu et al., 2022), while awareness activates norms that influence sustainable consumption and lifestyle choices (Jahari et al., 2022). Additionally, perceived behavioral control, shaped by awareness and confidence, affects decisions related to energy conservation and waste reduction among campus stakeholders (Ramos & Yunanto, 2023). Global warming awareness and environmental concern also positively correlate with pro-environmental behaviors, reinforcing the role of cognitive understanding in shaping sustainable actions (Yilmaz & Can, 2020).

Overall, the findings suggest that knowledge and awareness are not isolated factors but interdependent attributes that activate behavioral mechanisms essential for green campus management. Universities that integrate knowledge dissemination and awareness-building strategies report higher levels of stakeholder engagement, proactive student participation, and improved environmental performance. Conversely, lack of awareness and behavioral commitment often leads to failure in sustainability initiatives (Amaral et al., 2021).In the view of Green Campus Initiatives (GCI), the studies by Zhu et al. (2020) and Ribeiro et al. (2021) focus on green campus initiatives and their role in promoting sustainability awareness and engagement. Zhu et al. (2020) found that successful green campus projects contribute to achieving the Sustainable Development Goals (SDGs) and foster positive perceptions of sustainability among students. This suggests that such initiatives provide practical experiences, enhancing students' understanding of environmental challenges and solutions. Similarly, Ribeiro et al. (2021) identify increased engagement as a major outcome of green campus efforts, aligning student activities with institutional sustainability goals. These initiatives serve as a platform for active participation, thus reinforcing the importance of involving the campus community in sustainable practices. Both studies support the idea that green campus initiatives create a culture of sustainability, bridging the gap between theoretical knowledge and practical engagement.

Liu et al. (2020) and Wu et al. (2022) highlight the mediating role of attitudes, norms, and intentions in transforming environmental knowledge into action. Zhu et al. (2020) and Ribeiro et al. (2021) affirm that green campus initiatives promote student engagement and sustainability awareness. However, Amaral et al. (2021) caution against overlooking the importance of planning, funding, and stakeholder engagement in ensuring the success of sustainability efforts. Together, these findings provide a comprehensive understanding of how green practices can be effectively implemented in academic settings, contributing to achieving broader sustainability goals.

Mediating Role of Attitudes, Intentions, and Norms

Knowledge alone is not sufficient; its true power lies in shaping psychological constructs that drive behavior. This represents one of the most significant findings in the literature. The Knowledge-Attitude-Behavior Pathway Liu, Teng, and Han (2020) provide a clear model illustrating how environmental knowledge influences attitudes

and behavioral intentions. In essence, knowledge encourages individuals to care about the environment (attitude) and motivates them to act (intention), ultimately resulting in tangible pro-environmental behavior. The Influence of Personal NormsWu, Zhu, and Zhai (2022) integrate the Theory of Planned Behavior, highlighting that personal norms—an individual's internal sense of moral obligation—are activated by environmental knowledge. When students understand the consequences of waste, they feel a stronger obligation to act responsibly. Fostering Organizational Citizenship Anwar et al. (2020) demonstrate that Green Human Resource Management (GHRM), which emphasizes raising awareness and knowledge, enhances Organizational Citizenship Behavior towards the environment (OCBE). This behavior extends beyond formal job duties, with individuals proactively suggesting eco-friendly improvements, driven by a strong sense of responsibility nurtured by organizational initiatives focused on awareness.

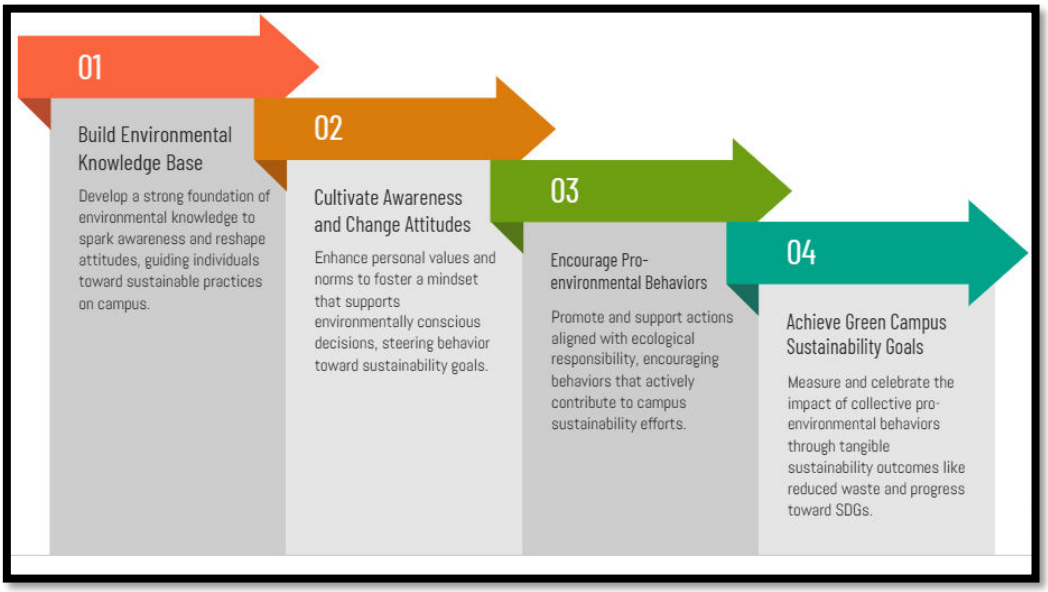

Figure 1: Behavioral Effects in Knowledge and Awareness for the Green Campus Management (GCM)

Figure 1 shows the behavioral effects of knowledge and awareness for Green Campus Management (GCM), which demonstrates a dynamic process that transforms cognitive understanding into sustainable action. By building a strong environmental knowledge base, individuals gain the information and comprehension needed to recognize the importance of ecological balance within campus life. This knowledge then fosters awareness and attitude change, encouraging the development of environmental values, personal responsibility, and a collective sense of stewardship. As awareness deepens, it naturally leads to pro-environmental behaviors, where students, staff, and faculty actively participate in recycling, energy conservation, and other green initiatives. These behavioral shifts collectively contribute to achieving Green Campus Sustainability Goals, resulting in tangible improvements such as reduced waste, efficient resource use, and measurable progress toward the Sustainable Development Goals (SDGs). Thus,

knowledge and awareness function not only as informational attributes but also as behavioral catalysts that align individual actions with institutional sustainability objectives, creating a culture of continuous environmental commitment on campus.

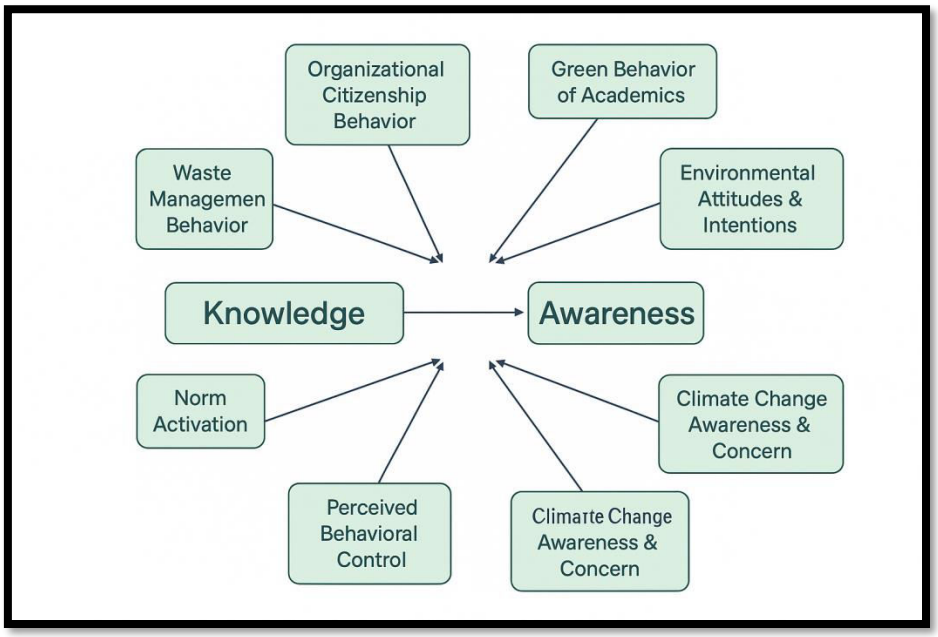

Figure 2: Mapping diagram on Behavioral Effect on Knowledge and awareness attributes of Green Campus Management

Figure 2 above is a concept map that shows knowledge and awareness are central attributes influencing multiple behavioral effects in green campus management. From the Knowledge side, behaviors include Organizational Citizenship Behavior, Waste Management Behavior, Norm Activation, and Perceived Behavioral Control, all of which reflect informed actions like recycling, energy conservation, and voluntary sustainability efforts. On the Awareness side, behaviors such as Green Behavior of Academics, Environmental Attitudes & Intentions, and Climate Change Awareness & Concern emerge, driving proactive engagement and shaping attitudes toward sustainability. The map emphasizes that these two attributes are interconnected, forming a foundation for activating norms, shaping intentions, and enabling sustainable practices across campus stakeholders.

Conclusion

In conclusion, the extant literature from 2020 to 2025 firmly positions knowledge and awareness as a critical attribute of GCM with profound behavioral effects. Environmental knowledge acts as a primary driver, which is then mediated by attitudes, norms, and intentions, and is significantly amplified by structured organizational practices. The positive perceptions and behavioral outcomes resulting from effective GCM initiatives highlight the importance of providing knowledge and fostering an institutional culture and infrastructure that enables and encourages the campus community to act upon it.

The synthesis of these studies underscores the significant role of environmental knowledge and awareness in fostering pro-environmental behaviors within the context of Green Campus Management. Successful implementation of Green Campus Management (GCM) requires careful planning, adequate resources, and active stakeholder engagement. Universities aiming to achieve sustainability goals must prioritize educational and awareness programs to cultivate a campus culture that supports and practices sustainability.

Educational Programs Universities should invest in comprehensive environmental education programs to enhance knowledge and awareness among the campus community. These programs can include curriculum integration, workshops, seminars, and awareness campaigns aimed at promoting sustainability and environmental stewardship. Stakeholder Engagement: Active involvement of all campus stakeholders, including students, staff, and external partners, is crucial for successful GCM. Engaging stakeholders in decision-making processes and sustainability initiatives fosters a sense of ownership and commitment to environmental goals, thereby enhancing the overall effectiveness of sustainability efforts. This involves the development and enforcement of policies that promote sustainable practices, as well as the integration of sustainability considerations into everyday campus operations and decision-making processes. Continuous Assessment and regular evaluation of green initiatives and feedback mechanisms can help refine and improve sustainability efforts on campus. Using key performance indicators, sustainability reporting, and feedback mechanisms, universities can monitor the progress of their sustainability initiatives and make informed decisions to enhance their effectiveness. By focusing on these areas, universities can effectively promote the culture of sustainability and achieve their environmental objectives. Furthermore, these implications provide a framework for guiding the development and implementation of comprehensive Green Campus Management strategies that align with broader sustainability goals and objectives.

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Conflict of interest statement
The author declares no conflict of interest.

Declaration of statement
The authors affirm that this manuscript is original work that has not been published previously and is not under consideration for publication elsewhere. All sources of information have been properly acknowledged, and all data are accurate to the best of the authors' knowledge.

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