DOI: https://doi.org/10.71085/rjhsa.04.04.163

A double-blind, peer-reviewed, open-access, and an HEC-recognized Y-category Journal

Research Journal of Human and Social Aspects

Web link: https://rjhsa.cclll.org

P-ISSN: 3006-9696, E-ISSN: 3006-970X

Volume 4 Issue 4, 2026, Page Range: 389-408



From Passive Cognition to Active Stewardship: Assessing Environmental Sustainability Awareness, Green Self-efficacy, and Eco-conscious Lifestyle Choices in Higher Education

Sawera Abid[1] Ghulam Muhammad Malik[2] Sahibzada Shamim-ur-Rasool[3]

[1] MPhil Scholar, Institute of Education, University of Sargodha, Sargodha, Punjab, Pakistan.
[2] Institute of Education, University of Sargodha, Sargodha, Punjab, Pakistan.
[3] Institute of Education, University of Sargodha, Sargodha, Punjab, Pakistan.

Correspondence Author: ghulam.muhammad@uos.edu.pk

Article information

Article History:

Received: 2026-09-05

Received in revised form: 2026-10-07

Accepted: 2026-10-13

Published Online: 2026-11-06

Keywords:

Environmental Sustainability Awareness; Green Self-efficacy; Eco-conscious Lifestyle Choices; Attitude-behavior Gap; Higher Education; Pakistan.

ABSTRACT

The present research focuses on the perception of Environmental Sustainability Awareness (ESA), Green Self-Efficacy (GSE), and Eco-Conscious Lifestyle Choices (ECLC) among public university students. To conduct the current study, a cross-sectional quantitative survey methodology was used with the help of a multistage stratified sampling strategy in three faculties and six departments of the University of Sargodha, Pakistan. Data collection tools included a 45-item structured questionnaire, resulting in a final sample of 300 undergraduate and graduate students. The reliability was confirmed by Cronbach's alpha (0.842 for ESA, 0.795 for GSE, and 0.811 for ECLC). These results show that students have elevated levels of environmental awareness concerning the influence of humans on climate change and acknowledge their moral and intergenerational responsibility for environmental protection. However, information seeking was moderate. Concerning green self-efficacy, students believe in their personal efficacy and interpersonal peer advocacy, but their self-efficacy was low in cases of obstacles in the form of financial problems and lack of infrastructure, such as choosing an environmentally friendly product with restricted finances and proper disposal of waste in inefficient recycling facilities. Consequently, the learners always practiced cheap and easy-to-manage conservation practices, including waste segregation and reuse, whereas practices that involve market infrastructure or financial expenditure, such as evaluating product sustainability and refusing to use plastic products, were lower. From this study, prominent levels of cognition alone do not motivate a full behavioral change; hence, universities and policymakers need to enhance green self-efficacy through a combination of environmental education and sustainability infrastructure on campus.

© 2026 by the Authors. Abid, Malik & Shamim-ur-Rasool. This article is an open-access distributed under the terms and conditions of the Creative Commons Attribution-ShareAlike 4.0 International (CC BY-SA 4.0) License https://creativecommons.org/licenses/by-sa/4.0/

The Journal is published quarterly (March, June, September & December) by the Centre for Children Literacy and Lifelong Learning (CCLLL), Pakistan. **Web link:** https://cclll.org

Introduction

The global ecological crises – climate change, biodiversity loss, pollution, and resource depletion – are severe threats, most of which are caused by unsustainable human activities and consumption patterns. These challenges can only be met by changing the way people behave, especially by young university students, who are potential leaders, decision-makers, and can be important agents of societal change (Gifford & Nilsson, 2014; Stern, 2000; United Nations, 2015). Higher education institutions have a considerable influence on Environmental Sustainability Awareness (ESA) through the incorporation of sustainability into the curriculum, the implementation of green campus initiatives and the development of ecological responsibility (Barth et al., 2007; Wang et al., 2021). While greater awareness often leads to pro-environmental attitudes and sustainable consumption intentions (Lee, 2008; Nguyen et al., 2018), empirical studies repeatedly reveal the 'attitude–behavior gap', whereby knowledge does not necessarily lead directly to active, eco-conscious lifestyle changes (AELC), including reducing waste, saving energy and buying sustainably (Kollmuss & Agyeman, 2002).

To overcome this dichotomy, psychological empowerment constructs should be assessed along with cognitive awareness. Theories such as the Theory of Planned Behavior (TPB) (Ajzen, 1991) and Social Cognitive Theory (SCT) (Bandura, 1997) have theorized that initiation of behavior is significantly dependent upon perceived behavioral control and self-efficacy beliefs. Green self-efficacy (GSE) is a psychological catalyst in an environmental context and refers to an individual's self-assurance in his/her ability to conduct pro-environmental behaviors (Cleveland et al., 2012; Onel & Mukherjee, 2017). Raising environmental awareness can significantly increase students' GSE by increasing their sense of control and competence in the environment (Taufique et al., 2017; Yusliza et al., 2020). People with both elevated levels of environmental literacy and self-efficacy are much abler to overcome situational obstacles and adopt sustainable lifestyle behaviours (Bamberg & Möser, 2007; Schunk & DiBenedetto, 2020).

Although there has been increased academic interest in the field of youth environmental engagement, there are important gaps in the empirical research literature about the interactions between ESA and GSE on ECLC. Most studies conducted so far focus on awareness, self-efficacy, and green behavior separately and not within an integrated framework (Gifford & Nilsson, 2014; Yusliza et al., 2020). Moreover, there are limited resources, infrastructural constraints, and not enough environmental education in developing countries such as Pakistan, which exacerbates ecological problems, thus necessitating context-specific research (Gifford & Nilsson, 2014; Wang et al., 2021). Although efforts are made to construct knowledge in the educational environment, very few programs focus on constructing students' psychological confidence and their ability to act, and the processes of behavioral change are not well studied in non-Western higher education contexts (Schunk & DiBenedetto, 2020).

To address this gap, this study examined public university students' perceptions of environmental sustainability awareness, green self-efficacy, and eco-conscious lifestyle behaviors. The findings are grounded in Social Cognitive Theory and the Theory of Planned Behavior (Ajzen, 1991; Bandura, 1997) and may serve as actionable information for university administrators, educators, and policymakers to create educational strategies that go beyond information dissemination and empower youth to adopt lifestyles that promote sustainability.

Literature Review

Education is considered a key factor in raising awareness about sustainability when it comes to behavior change, and with the current global environmental emergency, higher education institutions are positioned at the heart of sustainable behaviors, making student engagement crucial for promoting ecological preservation (Hamid et al., 2017). Theory of Planned Behavior (TPB) (Ajzen, 1991), Social

Cognitive Theory (SCT) (Bandura, 1986, 1997), and the New Environmental Paradigm (NEP) (Dunlap et al., 2000) can be used to explain how cognitive, social, and moral factors affect eco-friendly outcomes (Ajzen, 1991; Bandura, 1986; Dunlap et al., 2000; Zhang et al., 2024). Environmental Sustainability Awareness (ESA), which refers to cognitive knowledge, affective concern, and behavioral dispositions toward natural conservation (Jena & Nayak, 2023; Kaur & Kumar, 2022), plays a pivotal role in these paradigms. Apart from the physical interventions that are usually foreseen by the traditional initiatives conducted on campus. Beyond the physical interventions traditionally envisioned by campus initiatives, the role of social interactions, educational curricula, and modern communication platforms can notably speed the adoption of sustainable behaviors (Chen et al., 2025; Hamid et al., 2017).

Eco-Conscious Lifestyle Choices (ECLC) are daily choices made by individuals based on values such as sustainable consumption, the conservation of energy, water, and waste, and green transportation, which seek to reduce their individual ecological footprints (Almeida et al., 2024; Kim & Kim, 2023; Stern, 2000). The decisions are made through a systematic approach of environmental stewardship, rooted in intrinsic values, social norms, and institutional structures (Hassan et al., 2022; Nguyen et al., 2023; Zhu & Chen, 2023). Empirical evidence shows that green purchasing intention and responsible behavior are directly linked to high environmental literacy, but environmental literacy is not always enough to guarantee the development of consistent pro-environmental behaviors, because it is influenced by personal and contextual barriers (Guiao & Lacap, 2022; Kim & Lee, 2023; Yang et al., 2024).

Green Self-Efficacy (GSE) is one of the psychological mechanisms linking the awareness-behavior gap (Chen et al., 2015; Kollmuss & Agyeman, 2002; Rahman & Liu, 2023), which refers to a person's confidence in their capacity to organize and carry out activities to attain environmental objectives. GSE is based on the concept of self-efficacy as introduced by Bandura in SCT, and involves specific dimensions, such as resource conservation, waste management, sustainable consumption, and collective environmental action (Bandura, 1997; Thøgersen, 2011). A prominent level of GSE allows them to conquer social and economic barriers and help to form long-term sustainable behaviors through their personal environmental concern (Wang et al., 2024; Zhao et al., 2023).

Prominent “awareness-behavior gap” still exists despite a huge amount of research, especially in developing countries such as Pakistan, where empirical research on integrated models is limited (Amjad et al., 2024; Kollmuss & Agyeman, 2002). Previous studies tend to investigate environmental awareness, green self-efficacy and green lifestyle behaviors separately, but this study intends to explore university students’ perceptions regarding Environmental Sustainability Awareness (ESA), Eco-Conscious Lifestyle Choices (ECLC), and Green Self-Efficacy (GSE) (Bandura, 1997; Chen et al., 2015). This research explores their opinions to gain insights into the psychological mechanisms that support sustainable behaviors in developing settings (Amjad et al., 2024; Wang et al., 2025).

Statement of Problem

Sustaining the environment has gained greater importance in recent years, due to growing threats from climate change, pollution, resource depletion, and biodiversity loss to ecological and social well-being. While universities are important agents for building environmentally responsible knowledge and practices in young people, raising awareness of the environment does not always lead to sustainable lifestyle choices. Such persistent awareness–behaviour disconnection raises the question whether knowledge only is enough to promote sustainability (Kollmuss & Agyeman, 2002; Gifford & Nilsson, 2014). A psychological reason for this disconnection could be in people's perception of their own green self-efficacy (how confident they are in their ability to engage in behavior that is beneficial to the environment). According to Bandura's (1997) Social Cognitive Theory, people who think they can do a behavior will be more likely to start and sustain the behavior.

The study found that environmental knowledge and awareness can be a factor in the adoption of sustainable behavior, whereas self-efficacy can be a factor in the willingness and ability to adopt pro-Environmental behavior (Taufique et al., 2016; Yusliza et al., 2020). But very few empirical studies have investigated the relationship between environmentally sustainable awareness and adopting eco-friendly lifestyle behaviors using the psychological concept of green self-efficacy among university students in a developing country (Pakistan). This is a significant research need, as future professionals and decision-makers, university students, have choices they make in their everyday lives that can help to either exacerbate or alleviate environmental sustainability issues. Hence, this study overcomes this gap by exploring students' perceptions regarding environmental sustainability awareness, eco-conscious lifestyle, and green self-efficacy.

Delimitations of the Study

To maintain a feasible scope and clear empirical focus, the study established the following specific boundaries and delimitations:

- Only registered students at the undergraduate and postgraduate level at the University of Sargodha in Punjab, Pakistan participated in this study. Other than students, schoolchildren, college students, and university teachers were excluded.
- Collection of data was confined to six academic departments belonging to three faculties (Faculty of Social Sciences, Faculty of Sciences, and Faculty of Agriculture): Economics, Education, Food Science, Zoology, Botany, and Soil & Environmental Science.
- The scope of the theoretical model in this study was limited to the assessment of only three main constructs based on Social Cognitive Theory and the Theory of Planned Behavior: Environmental Sustainability Awareness (independent variable), Green Self-Efficacy (psychological/mediating variable), and Eco-Conscious Lifestyle Choices (dependent variable). Other variables that could affect eco-friendly behavior, such as socioeconomic background, government environmental policies, upbringing at home, peer influence, environmental laws, and institutional facilities at the campus were not considered in this study.
- The methodology for this research entailed a cross-sectional, quantitative survey approach where self-reporting surveys (both print and Google Forms) were conducted once. Thus, the results of this study represent participants' perceived knowledge, confidence, and self-reported behavior.
- Because the sample was drawn exclusively from one public-sector university in Pakistan, the findings are representative of the studied student cohort and cannot be unconditionally generalized to students in other geographical regions, private universities, or the broader national public.

Significance of Study

The present study is important as it contributes to the understanding of the relationship between Environmental Sustainability Awareness and university students' Eco-Conscious Lifestyle Choices and how Green Self-Efficacy may account for this relationship. The study adds the psychological dimension of Green Self-Efficacy to the proposed investigation of this study and thereby gives a psychological perspective on the role of students' confidence in their ability to take environmentally responsible actions, which also follows Social Cognitive Theory (Bandura, 1997), where the role of students' self-efficacy in the process of translating their awareness into sustainable lifestyle choices has been emphasized. In practice, the results could help guide colleges and schools in creating sustainability education and campus programs that shift from information delivery to boosting the confidence and capability of students to act on sustainability. The study also has implications for policymakers and sustainability stakeholders, as data on the association between awareness and self-efficacy and eco-conscious behavior can help in designing more effective environmental education and behavioral interventions. Moreover, the study has

focused on the student population at the university level, which adds evidence from a developing country context which is under-researched in sustainability studies. Overall, the study could provide a basis for environmental education and sustainability studies, as it emphasizes the need to incorporate environmental awareness with psychological capabilities to promote consistent choices for an eco-conscious lifestyle among young adults.

Ethical Considerations

Prior to data collection, formal institutional approval and ethical clearance were obtained from the institutional review board/departmental ethics committee at the University of Sargodha. The conduct of this study strictly adhered to established ethical standards for behavioral and educational research involving human participants, structured around the following safeguards:

- The purpose, nature and procedures of the research were clearly explained to all respondents in an introductory statement in the form of an introductory note in both the hard copy questionnaire and Google Forms. Participation in the study was entirely voluntary, and the respondent's submission of the completed questionnaire implied their consent.
- Students were clearly told that participation was purely voluntary, and that they were free to opt out of the research without fear of incurring any kind of academic, institutional, or personal repercussions.
- To ensure confidentiality of the participants, no personal identifiable information, such as students' registration number, name, contact number, or email address, was collected. The only demographic information collected included gender, department, study level, semester range, CGPA range, and type of residence.
- The digital information was stored on devices that had password protection. This ensured that the main research team members could only access the information. All the responses obtained were only used in analysis in SPSS.
- The questions in the survey concerned sustainability perceptions, individual perception of environmental efficacy, and general life routines, thereby posing no psychological, physical, or academic risk to the students.

Objectives of the Study

From the conceptual framework, theoretical foundation and methodology of the research, the main goals of the research are to:

- To examine the level of Environmental Sustainability Awareness (ESA) of university students in three primary areas, including awareness of environmental issues, knowledge about sustainable solutions and environmental responsibility and ethics.
- To evaluate the level of Green Self-Efficacy (GSE) of university students in three primary areas, including overcoming environmental barriers, performing environmental behaviors, and using environmental knowledge and advocacy.
- To determine the level of Eco-Conscious Lifestyle Choices (ECLC) of university students regarding sustainable consumption, waste management, and consumption ethics.

Research Questions of the Study

From the theoretical base, dimensions, and the objective of the study, the following research questions emerge:

- What is the overall level of Environmental Sustainability Awareness (ESA) among university students regarding awareness of environmental problems, understanding of sustainable solutions, and environmental responsibility and ethics?
- What is the level of Green Self-Efficacy (GSE) among university students in terms of confidence in overcoming environmental barriers, performing environmental behaviors, and applying/advocating environmental knowledge?

- To what extent do university students engage in Eco-Conscious Lifestyle Choices (ECLC) across sustainable consumption practices, waste management and responsible consumption, and consumption ethics?

Research Methodology

The study uses quantitative empirical approach to investigate the Environmental Sustainability Awareness (ESA) of university students and the relationship between ESA and Green Self-Efficacy (GSE) and Eco-Conscious Lifestyle Choices (ECLC).

Research Design

The study followed quantitative research design. The descriptive framework evaluated students' ESA, GSE, and ECLC levels in higher education.

Population and Sampling

The target population were undergraduate and graduate students at the University of Sargodha in Punjab (Pakistan). A multistage stratified random sampling technique was used to select 360 participants. In the first stage, three faculties, including the Faculty of Social Sciences, Faculty of Sciences, and Faculty of Agriculture, were randomly selected. In the second stage, two randomly chosen departments were selected from each faculty. In the last stage, 120 participants in each faculty, with thirty-five undergraduates and twenty-five graduates from each department, were selected using a non-proportionate stratified sampling technique. After the surveys were administered, 325 responses were retrieved, and 25 were incomplete, with a net response rate of 83.3% of valid cases for analysis (n =300).

Research Instrument

The research instrument data were collected through a self-administered, 45-item structured questionnaire that used a 5-point Likert scale. The instrument was divided into four parts. The data in Section A were demographic data such as department, degree level, semester, CGPA, gender, and residence. The 15-item ESA Scale, which measured awareness of environmental issues, understanding of sustainable solutions and environmental responsibility, was presented in Section B and graded on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree). The 15-item GSE Scale for confidence in overcoming barriers, performing behaviors and applying knowledge was included in Section C (Not at all Confident—Very Confident). The 15-item ECLC Scale for sustainable consumption, waste management and consumption ethics (Section D) was scored on a scale of 1 (Never) to 5 (Always). All statements were framed in relation to the ecological issues of the region of Pakistan i.e., seasonal pollution in the air and scarcity of water.

Validity and Reliability

A five-member expert panel (Research Methodology, Psychometrics, and Environmental Education) assessed content and face validity by reviewing each item for clarity, relevance, and theoretical fit. We revised items based on their feedback and followed up with a pilot study (N = 45 students, with each faculty equally represented) to assess instrument clarity and average completion time, which was 10–15 minutes. Internal consistency of the scales was examined by reliability analysis using Cronbach's alpha, and the results were as follows: ESA (α = .842), GSE (α = .795), ECLC (α = .811), and overall scale (α = .868), which were all above the accepted reliability criterion of .70.

Data Collection and Data Analysis

After obtaining institutional approval, data were collected using dual mode (printed and online questionnaires using Google Forms). A total of three hundred questionnaires were included in the analysis because 325 were returned and twenty-five were not completed. IBM SPSS Statistics was used to analyze the data. Demographic profiles and variable-level (ESA, GSE, ECLC) response patterns were summarized using descriptive statistics such as frequencies, percentages, means, and standard deviations.

Results and Findings

The following were the findings and conclusions that came from the study:

Demographics

The following is the distribution of respondents according to department, gender, level of study, semester, CGPA, and residence.

Table 4.1: *Demographic Characteristics of Respondents (N = 300)*

Variable	Category	Frequency	Percentage (%)
Department	Economics	50	16.7
	Education	50	16.7
	Food Science	50	16.7
	Zoology	50	16.7
	Botany	50	16.7
	Soil & Environmental Science	50	16.7
Gender	Male	56	18.7
	Female	244	81.3
Level of Study	Graduate	62	20.7
	Undergraduate	238	79.3
Semester	1st–2nd	59	19.7
	3rd–4th	89	29.7
	5th–6th	87	29.0
	7th–8th	65	21.7
CGPA	2.00–2.50	16	5.3
	2.51–3.00	29	9.7
	3.01–3.50	139	46.3
	3.51–4.00	116	38.7
Residence	Urban	146	48.7
	Rural	154	51.3

A sample of three hundred respondents was duly taken with balanced representation of various academic departments, with 16.7% from each of the departments comprising Economics, Education, Food Science, Zoology, Botany and Soil & Environmental Science. Most of the cohort was female (81.3%) and mostly undergraduate (79.3%) and graduate (20.7%) students. The participants were distributed throughout the academic semesters, with the highest number in their 3rd–4th (29.7%) and 5th–6th (29.0%) semesters, followed by 7th–8th (21.7%) and 1st–2nd (19.7%) semesters. Academic results were outstanding, with 85.0% of students achieving a CGPA of 3.01 or higher (46.3% in the 3.01-3.50 bracket and 38.7% in the 3.51-4.00 range). Further, the background of residents was even, with 51.3% living in rural areas and 48.7% living in cities.

Item-Wise Frequency Analysis of Environmental Sustainability Awareness (ESA)

The following are the Descriptive Statistics of Students' Responses Regarding Various

Environmental Sustainability Awareness, including Awareness of environmental problems, Understanding of Sustainable Solutions and Environmental Responsibility & Ethics.

Table 4.2: *Dimension 1: Awareness of Environmental Problems*

Statements	SD f (%)	D f (%)	SD+D f (%)	N f (%)	A f (%)	SA f (%)	A+SA f (%)	Mean	SD	Interpretation
I am aware of serious environmental issues in Pakistan (e.g., smog, water scarcity).	39 (13.0)	35 (11.7)	74 (24.7)	44 (14.7)	94 (31.3)	88 (29.3)	182 (60.6)	3.52	1.36	High
I understand that human activities significantly contribute to climate change.	25 (8.3)	33 (11.0)	58 (19.3)	44 (14.7)	104 (34.7)	94 (31.3	198 (66.0	3.70	1.25	High
I am aware of the environmental consequences of deforestation.	15 (5.0)	34 (11.3)	49 (16.3)	62 (20.7)	118 (39.3)	71 (23.7)	189 (63.0)	3.65	1.11	High
I understand the long-term environmental effects of plastic pollution.	15 (5.0)	31 (10.3)	46 (15.3)	65 (21.7)	114 (38.0)	75 (25.0)	189 (63.0)	3.68	1.11	High
I regularly seek information about environmental issues through the media or other sources.	20 (6.7)	46 (15.3)	66 (22.0)	87 (29.0)	91 (30.3)	56 (18.7)	147 (49.0)	3.39	1.15	Moderate

Respondents were aware of the key environmental issues and showed prominent levels of agreement that human activities contribute to climate change (M = 3.70; SD = 1.25; 66.0% agreed). Similarly, high levels of concern were expressed about the long-term effects of plastic pollution (M = 3.68, SD = 1.11, 63.0% agreement), deforestation (M = 3.65, SD = 1.11, 63.0% agreement), and regional issues including smog and water scarcity in Pakistan (M = 3.52, SD = 1.36, 60.6% agreement). Active information-seeking behavior via media or other sources, however, scored the least, with M = 3.39 and SD = 1.15, which means a moderate level of engagement. In general, students have a basic awareness of the main environmental issues and show a positive response to recognizing these issues, but there is some lack of connection between passive awareness and initiative-taking information-seeking skills.

Table 4.3: *Dimension 2: Understanding of Sustainable Solutions*

Statements	SD f (%)	D f (%)	SD+D f (%)	N f (%)	A f (%)	SA f (%)	A+SA f (%)	Mean	SD	Interpretation
I understand how renewable energy can reduce environmental damage.	18 (6.0)	29 (9.7)	47 (15.7)	65 (21.7)	119 (39.7)	69 (23.0)	188 (62.7)	3.64	1.12	High
I know practical strategies to reduce my environmental impact in daily life.	20 (6.7)	32 (10.7)	52 (17.4)	75 (25.0)	107 (35.7)	66 (22.0)	173 (57.7)	3.56	1.14	High
I understand the key principles of a sustainable lifestyle.	10 (3.3)	45 (15.0)	55 (18.3)	74 (24.7)	120 (40.0)	51 (17.0)	171 (57.0)	3.52	1.05	High
I am aware of environmental conservation initiatives in Pakistan.	12 (4.0)	32 (10.7)	44 (14.7)	82 (27.3)	107 (35.7)	67 (22.3)	174 (58.0)	3.62	1.07	High
Individual actions have little impact on solving environmental problems.	28 (9.3)	38 (12.7)	66 (22.0)	75 (25.0)	88 (29.3)	71 (23.7)	159 (53.0)	3.45	1.24	Moderate

Participants had a high overall knowledge of sustainable solutions (M = 3.64, SD = 1.12; 62.7% agreement) with a high awareness that renewable energy can minimize environmental damage. The participants also showed a significant level of awareness about environmental conservation programs in Pakistan (M = 3.62, SD = 1.07, 58.0 % agreement), daily practical actions to reduce environmental impacts (M = 3.56, SD = 1.14, 57.7 % agreement) and the basic principles of sustainable living (M = 3.52, SD = 1.05, 57.0 % agreement). On the other hand, the answer to whether there is a trivial effect of individual actions scored at a moderate level (M = 3.45, SD = 1.24). Overall, students' basic understanding of sustainable mechanisms and policies is quite good but is dichotomous in their belief in the effectiveness of individual action in addressing large-scale environmental issues.

Table 4.4: *Dimension 3: Environmental Responsibility & Ethics*

Statements	SD f (%)	D f (%)	SD+D f (%)	N f (%)	A f (%)	SA f (%)	A+SA f (%)	Mean	SD	Interpretation
I feel personally responsible for contributing to environmental protection.	18 (6.0)	45 (15.0)	63 (21.0)	67 (22.3)	102 (34.0)	68 (22.7)	170 (56.7)	3.52	1.17	High
I believe it is my duty to stay informed about environmental sustainability.	16 (5.3)	30 (10.0)	46 (15.3)	68 (22.7)	105 (35.0)	81 (27.0)	186 (62.0)	3.68	1.13	High
Universities should actively promote environmental awareness among students.	16 (5.3)	28 (9.3)	44 (14.6)	70 (23.3)	104 (34.7)	82 (27.3)	186 (62.0)	3.69	1.13	High
I feel morally responsible for protecting the environment for future generations.	16 (5.3)	35 (11.7)	51 (17.0)	61 (20.3)	99 (33.0)	89 (29.7)	188 (62.7)	3.70	1.17	High
I believe individual efforts are crucial for solving environmental problems.	16 (5.3)	30 (10.0)	46 (15.3)	68 (22.7)	105 (35.0)	81 (27.0)	186 (62.0)	3.68	1.13	High

The students displayed good moral responsibility and ethical commitment concerning sustainability in the environment. The maximum level of agreement among the respondents was about their moral obligation to protect the environment for future generations (M = 3.70, SD = 1.17; 62.7%) and the moral obligation to foster environmental consciousness at university (M = 3.69, SD = 1.13; 62.0%). The individual ethical responsibilities were also highly agreed upon (M = 3.68, SD = 1.13; 62.0% agreement). This dimension had the lowest rating (M = 3.52, SD = 1.17), but a high baseline overall. In general, these results prove that students' ethical values are well developed and their environmental stewardship is strong.

Item-Wise Frequency Analysis of Green Self-Efficacy (GSE)

The following are the students' responses regarding various aspects of Green Self-Efficacy, including Confidence in Overcoming Environmental Barriers, Confidence in Performing Environmental Behaviors and Environmental Knowledge Application & Advocacy.

Table 4.5: *Dimension 1: Confidence in Overcoming Environmental Barriers*

Statements	NAC f (%)	SC f (%)	NAC+SC f (%)	MC f (%)	C f (%)	VC f (%)	C+VC f (%)	Mean	SD	Interpretation
I am confident that I can save energy even if it requires extra effort.	27 (9.0)	62 (20.7)	89 (29.7)	74 (24.7)	88 (29.3)	49 (16.3)	137 (45.6)	3.23	1.21	Moderate
I am confident that I can recycle even when recycling facilities are limited.	18 (6.0)	55 (18.3)	73 (24.3)	89 (29.7)	102 (34.0)	36 (12.0)	138 (46.0)	3.28	1.08	Moderate

I am confident that I can encourage my family or peers to adopt eco-friendly habits.	20 (6.7)	51 (17.0)	71 (23.7)	84 (28.0)	103 (34.3)	42 (14.0)	145 (48.3)	3.32	1.11	Moderate
I am confident that I can make environmentally responsible choices even with a limited budget.	25 (8.3)	57 (19.0)	82 (27.3)	92 (30.7)	93 (31.0)	33 (11.0)	126 (42.0)	3.17	1.12	Moderate
I am confident that I can significantly reduce my waste production.	25 (8.3)	53 (17.7)	78 (26.0)	80 (26.7)	99 (33.0)	43 (14.3)	142 (47.3)	3.27	1.16	Moderate

The respondents showed moderate scores with regards to their confidence to overcome the environment barriers across all measures of Green Self-Efficacy (GSE). Efficacy for interpersonal advocacy was highest regarding encouraging family and peers to engage in eco-friendly behaviors (M = 3.32, SD = 1.11; 48.3% confident or noticeably confident). Low levels of facilities (M = 3.28, SD = 1.08; 46.0% confidence) were also reported as were personal waste production (M = 3.27, SD = 1.16; 47.3% confidence) and saving energy at the cost of extra effort (M = 3.23, SD = 1.21; 45.6% confidence). The lowest confidence was in the ability to make an eco-conscious choice while on a budget (M = 3.17, SD = 1.12; 42.0% confidence). In general, the students have a low level of self-efficacy and financial difficulties and structural limitations create clear challenges for making environmental decisions.

Table 4.6: *Dimension 2: Confidence in Performing Environmental Behaviors*

Statements	**NAC** **f (%)**	**SC** **f (%)**	**NAC+SC** **f (%)**	**MC** **f (%)**	**C** **f (%)**	**VC** **f (%)**	**C+VC** **f (%)**	**Mean**	**SD**	**Interpretation**
I can correctly separate waste for recycling.	20 (6.7)	54 (18.0)	74 (24.7)	94 (31.3)	81 (27.0)	51 (17.0)	132 (44.0)	3.30	1.15	Moderate
I can consistently avoid using single-use plastic items.	25 (8.3)	49 (16.3)	74 (24.6)	79 (26.3)	80 (26.7)	67 (22.3)	147 (49.0)	3.38	1.23	Moderate
I can use public transportation, carpooling, or walking when possible.	22 (7.3)	40 (13.3)	62 (20.6)	96 (32.0)	88 (29.3)	54 (18.0)	142 (47.3)	3.37	1.14	Moderate
I can effectively conserve water in my daily activities.	20 (6.7)	48 (16.0)	68 (22.7)	81 (27.0)	95 (31.7)	56 (18.7)	151 (50.4)	3.40	1.16	High
I can actively participate in environmental campaigns or clean-up activities.	21 (7.0)	47 (15.7)	68 (22.7)	95 (31.7)	80 (26.7)	57 (19.0)	137 (45.7)	3.35	1.16	Moderate

Initial levels of Green Self-Efficacy (GSE) were found to be moderate among respondents in relation to routine pro-environmental behaviors. The highest level of confidence was for water conservation daily (M = 3.40, SD = 1.16), with 50.4% of people feeling confident or confident

about conserving water. There was a moderate level of confidence also for avoiding single use plastics (M = 3.38, SD = 1.23, 49.0% confidence), sustainable transportation (walking, carpool, public transportation) (M = 3.37, SD = 1.14, 47.3% confidence), and environmental campaigns or clean-ups (M = 3.35, SD = 1.16, 45.7% confidence). The lowest score in this dimension was related to accurate waste for recycling (M = 3.30, SD = 1.15, 44.0% confidence). In general, students' self-efficacy is acceptable in handling simple daily activities, but it decreases in the ability to do handling activities that need specific technical knowledge or structured facilities in institutions, such as sorting garbage.

Table 4.7: *Dimension 3: Environmental Knowledge Application & Advocacy*

Statements	NAC f (%)	SC f (%)	NAC+SC f (%)	MC f (%)	C f (%)	VC f (%)	C+VC f (%)	Mean	SD	Interpretation
I am confident in applying my environmental knowledge to solve real-life problems.	14 (4.7)	58 (19.3)	72 (24.0)	86 (28.7)	83 (27.7)	59 (19.7)	142 (47.4)	3.38	1.14	Moderate
I am confident in explaining environmental issues and solutions to others.	17 (5.7)	52 (17.3)	69 (23.0)	84 (28.0)	77 (25.7)	70 (23.3)	147 (49.0)	3.44	1.18	High
I can independently learn and apply new eco-friendly practices.	20 (6.7)	55 (18.3)	75 (25.0)	71 (23.7)	88 (29.3)	66 (22.0)	154 (51.3)	3.42	1.21	High
I am confident that my individual actions can make a meaningful environmental impact.	20 (6.7)	41 (13.7)	61 (20.4)	81 (27.0)	90 (30.0)	68 (22.7)	158 (52.7)	3.48	1.18	High
I am confident that I can maintain eco-friendly habits in the long term.	19 (6.3)	55 (18.3)	74 (24.6)	92 (30.7)	75 (25.0)	59 (19.7)	134 (44.7)	3.33	1.17	Moderate

The level of self-efficacy in relation to environmental knowledge application and advocacy was moderate to high. There was an elevated level of confidence in believing that people can be effective in the environment (M = 3.48, SD = 1.18; 52.7% confident or confident), suggesting a prominent level of personal agency. The other two, communicating sustainability concepts to others and independently learning about sustainable practices, were also reported with high efficacy (M = 3.44, SD = 1.18; 49.0% confidence and M = 3.42, SD = 1.21; 51.3% confidence, respectively). Applying environmental knowledge to real-life problems was rated at moderate level (M = 3.38, SD = 1.14; 47.4% confidence) and maintaining pro-environmental behaviors in the long term was rated at the lowest level in this dimension (M = 3.33, SD = 1.17; 44.7% confidence). Students' confidence in learning, communication, and application of ecological knowledge is good overall, but maintaining a consistent behavioral approach is a challenge for them.

Item-Wise Frequency Analysis of Eco-Conscious Lifestyle Choices (ECLC)

The following are the students' responses regarding various Eco-Conscious Lifestyle Choices, including Sustainable Consumption Practices, Waste Management & Responsible Consumption

and Consumption Ethics & Environmental Responsibility.

Table 4.8: *Dimension 1: Sustainable Consumption Practices*

Statements	N f (%)	R f (%)	N+R f (%)	ST f (%)	O f (%)	A f (%)	O+A f (%)	Mean	SD	Interpretation
I turn off electrical appliances when not in use.	17 (5.7)	60 (20.0)	77 (25.7)	81 (27.0)	73 (24.3)	69 (23.0)	142 (47.3)	3.36	1.17	Moderate
I consciously reduce my water consumption.	27 (9.0)	39 (13.0)	66 (22.0)	78 (26.0)	95 (31.7)	61 (20.3)	156 (52.0)	3.40	1.16	High
I use energy-efficient appliances or light bulbs.	25 (8.3)	52 (17.3)	77 (25.6)	77 (25.7)	88 (29.3)	58 (19.3)	146 (48.6)	3.43	1.20	Moderate
I walk/cycle/use public transport for short distances.	30 (10.0)	52 (17.3)	82 (27.3)	76 (25.3)	84 (28.0)	57 (19.0)	141 (47.0)	3.34	1.19	Moderate
I use reusable items (bags, bottles, containers).	23 (7.7)	47 (15.7)	70 (23.4)	75 (25.0)	94 (31.3)	61 (20.3)	155 (51.6)	3.46	1.11	High

Overall, there was a moderate to elevated level of engagement in sustainable consumption reported by the respondents. This dimension was ranked highest with reusable items, bags, bottles, and containers, with a score of M = 3.46 and SD = 1.11 (51.6% reporting "often" or "always" on re-use of items). Conscious efforts to conserve water were also widely reported (M = 3.40, SD = 1.16, 52.0% frequency). Moderate consistency was seen with energy-saving behaviors such as using energy-efficient appliances or bulbs (M = 3.43, SD = 1.20; 48.6% frequency) and turning off "unused" electronics (M = 3.36, SD = 1.17; 47.3% frequency). At 47.0% frequency, the less widespread practice was to use sustainable modes of transportation (walking, cycling, public transport) (M = 3.34, SD = 1.19). In summary, students actively display pro-ecological behaviors related to resource conservation and waste reduction, but efforts are consistent in terms of their everyday life areas.

Table 4.9: *Dimension 2: Waste Management & Responsible Consumption*

Statements	N f (%)	R f (%)	N+R f (%)	ST f (%)	O f (%)	A f (%)	O+A f (%)	Mean	SD	Interpretation
I separate waste into recyclable and non-recyclable categories.	15 (5.0)	45 (15.0)	60 (20.0)	94 (31.3)	88 (29.3)	58 (19.3)	146 (48.6)	3.52	1.14	High
I repair items instead of discarding them.	20 (6.7)	58 (19.3)	78 (26.0)	77 (25.7)	84 (28.0)	61 (20.3)	145 (48.3)	3.39	1.19	Moderate
I avoid excessive packaging products.	24 (8.0)	59 (19.7)	83 (27.7)	81 (27.0)	83 (27.7)	53 (17.7)	136 (45.4)	3.32	1.20	Moderate
I reuse items such as jars/boxes.	23 (7.7)	51 (17.0)	74 (24.7)	86 (28.7)	82 (27.3)	58 (19.3)	140 (46.6)	3.38	1.16	Moderate

I donate old items instead of discarding.	20 (6.7)	49 (16.3)	69 (23.0)	86 (28.7)	80 (26.7)	65 (21.7)	145 (48.4)	3.45	1.12	Moderate

Table 4.9 shows respondents' Eco-Conscious Lifestyle Choices with regards to Waste Management and Responsible Consumption Habits. The results show that overall, the engagement in environmentally responsible behavior is at moderate to prominent level and comparatively better results in basic waste management practices. The highest mean score was obtained for the statement, "I separate waste into recyclable and non-recyclable category" (M = 3.52, SD = 1.14) and 48.6% of the respondents indicated that they separate waste often or always, which indicates that they are fairly aware and practice the appropriate waste management. In the area of reusing and conserving resources, moderate to high rates of donating used items (48.4%, M = 3.45, SD = 1.12) and repairing items (48.3%, M = 3.39, SD = 1.19) were reported. There were some inconsistencies in the consumption behaviors observed as moderate levels of engagement were found for reusing items like jars or boxes, (46.6%, M = 3.38, SD = 1.16), and avoiding products with too much packaging (45.4%, M = 3.32, SD = 1.20). On the whole, based on the findings, it can be stated that the participants of the survey are actively engaged in waste management processes; however, they are also concerned about responsible consumption practices, and it is still possible to promote the decrease and reuse of the materials in waste separation.

Table 4.10: *Dimension 3: Consumption Ethics & Environmental Responsibility*

Statements	N f (%)	R f (%)	N+R f (%)	ST f (%)	O f (%)	A f (%)	O+A f (%)	Mean	SD	Interpretation
I purchase environmentally friendly products.	14 (4.7)	65 (21.7)	79 (26.4)	83 (27.7)	89 (29.7)	49 (16.3)	138 (46.0)	3.41	1.19	Moderate
I prefer locally produced goods.	18 (6.0)	62 (20.7)	80 (26.7)	89 (29.7)	90 (30.0)	41 (13.7)	131 (43.7)	3.31	1.18	Moderate
I reduce meat consumption for environmental reasons.	21 (7.0)	47 (15.7)	68 (22.7)	92 (30.7)	84 (28.0)	56 (18.7)	140 (46.7)	3.36	1.16	Moderate
I refuse single-use plastic items (e.g., straws, cups, cutlery.	28 (9.3)	45 (15.0)	73 (24.3)	95 (31.7)	91 (30.3)	41 (13.7)	132 (44.0)	3.28	1.21	Moderate
I check whether a brand follows environmentally responsible practices before purchasing.	20 (6.7)	57 (19.0)	77 (25.7)	105 (35.0)	83 (27.7)	35 (11.7)	118 (39.4)	3.22	1.18	Moderate

The respondents had a moderate level of involvement in consumption ethics and environmental responsibility. In this dimension the highest score was related to the purchasing of eco-friendly products (M = 3.41, SD = 1.19), indicating a general tendency towards green purchasing decisions. Ethical issues related to diet and food sources were also noted with moderate proportions indicating a desire to consume less meat for environmental reasons (M = 3.36; SD = 1.16; 46.7% frequency) and preferring to eat locally produced food (M = 3.31; SD = 1.18; 43.7% frequency). Moderate (M = 3.28, SD = 1.21; 44.0% frequency) level was given to the active rejection of single-use plastics such as straws, cups, and cutlery, reflecting some inconsistencies in avoiding

hazardous convenience items. Finally, evaluating a brand's environmental responsibility before purchasing had the lowest score (M = 3.22, SD = 1.18; 39.4% frequency), which means that initiative-taking brand vetting is still relatively uncommon. In general, students have some understanding of ethical consumption but are not consistently consuming ethically.

Discussion

The empirical conclusions from this study present vital information related to the relationship between environmental awareness, psychological self-efficacy, and pro-environmental behavior among Pakistani university students. Through the analysis of these variables, this study reveals the dynamics of cognitive awareness and individual efficacy, as well as points of friction between them in a developing country context.

According to the descriptive findings, the level of environmental awareness among university students is quite satisfactory. A high degree of agreement was identified when it comes to anthropogenic factors causing climate change, persistent risks of plastic pollution, and ecological problems of the region, including smog and water scarcity. In addition, university students feel morally obliged to preserve the environment and recognize their generation's responsibility for ecological literacy. On the other hand, this combination of cognitive and emotional bases is countered by average performance in initiative-taking environmental information seeking. This variance indicates that although students learn about prevailing ecological discourses due to their overall exposure, they seldom indulge in seeking out specific information regarding their environmental literacy. Educational interventions in regions like Pakistan instigate general ecological concerns in the students without establishing any pattern of behavior or transformation of concerns into habitual patterns.

The investigation of green self-efficacy showed a distinct gap between internal agency and situational control. The students had comparatively high confidence in their ability to create an environmental effect and ability to convey their understanding of sustainability to others.

On the contrary, efficacy was highly compromised in cases where students were assessing their abilities to perform behaviors that have the potential to face some external, financial, or systemic barriers. Efficacy was lower when students were considering sustainable behaviors within the context of a student budget, as well as behaviors that involved effortful energy conservation and long-lasting habits. Self-efficacy is one of the key components in motivating performance by translating cognitive knowledge into action, as has been shown by organizational and behavioral studies (Chen et al., 2014).

The behavioral trends observed in relation to eco-conscious lifestyle factors point to the documented existence of the attitude-behavior gap. It is apparent that the students exhibited behaviors that were accessible, practical, and convenient. The behaviors involved include the use of reusable containers and bottles, conservation of water, and sorting of waste. Such behaviors are economically feasible and consistent with student lifestyles.

However, the students were reluctant to engage in those behaviors that required the existence of institutional infrastructures, commercial verification, and even economic considerations. Behaviors involving vetting corporate sustainability practices before buying were least practiced by the students compared to other behaviors, while avoidance of single-use convenience plastics and sustainable modes of transit came second and third, respectively. The behavioral gaps observed above validate the theory suggested by Kollmuss and Agyeman (2002), that environmental knowledge and attitude alone cannot drive behaviors unless there are institutional infrastructures and economic feasibility involved.

Conclusion

The present research has examined the behavior and patterns of Environmental Sustainability Awareness (ESA), Green Self-Efficacy (GSE), and Eco-Conscious Lifestyle Choices (ECLC) among the university students in a developing country setting. Based on the Theory of Planned Behavior and Social Cognitive Theory, the findings of this empirical research provide the following main implications:

University students are well-aware about environmental problems and sustainable ways to solve them as well as their own moral obligations to preserve the ecology. These students have acute knowledge about the current national and global challenges such as climate change, plastic pollution, smog, and water crises. Still, such cognitive awareness is mostly passive as can be seen from

low scores in information-seeking activity and monitoring of environmental problems independently.

Even though university students feel high personal self-confidence in individual actions, expressing environmentally friendly ideas, and conserving the environment in everyday life, their green self-efficacy decreases when facing various obstacles or barriers. Practical self-confidence is reduced by the lack of recycling infrastructure and budget constraints. Daily eco-friendly living practices tend to be mostly moderate to moderately high, but with observable differences in behavior. The regular and money-saving conservation practices (such as using reusable containers, recycling waste, and turning off the devices) are often followed. On the other hand, those behaviors that require systemic availability on the market or additional financial input (such as brand auditing, complete avoidance of disposable plastics, and change in diet) have significantly fewer people adopting them.

Despite high environmental awareness and ethics, it does not directly lead to environmentally conscious practices. Overcoming the existing attitude-behavior gap within college population involves reinforcing self-efficacy beliefs through practical actions on campus.

Recommendations

Based on the analysis of the results obtained concerning the awareness of the students, green self-efficacy and their lifestyles, the following action-oriented recommendations may be suggested for colleges, universities, and their administration as well as educators:

- Although general environmental awareness and moral responsibilities are high, passive attitude still prevails. Higher education institutions need to move away from just theoretical lectures on the environment and introduce more practical training, projects, and workshops to develop students' critical thinking skills as well as to make them aware of certified eco-labels and brands.
- When it came to self-efficacy and certain situations which prevented them from going green, lack of facilities, like recycling centers was mentioned. Therefore, universities need to set up standard multi-stream bins for recycling and waste segregation in all academic buildings, dormitories, and cafeterias.
- Since the issue of low budget was established to be an important barrier to eco-friendly decision-making, university management and students' services should work hand in hand with local suppliers of affordable eco-friendly items. Discounts on reusable cups and food containers, free public/campus shuttle services and cheap green supplies will help to reduce the economic barriers.
- As far as the problem of consistent avoidance of disposable plastics remains relevant, the universities' management should adopt certain policies that would ban the use of single-use plastic bags, cutlery, and plastic straws on campus canteens and during different university events and replace them with biodegradable or reusable options.
- Considering high self-reported confidence in interpersonal advocacy and peer influence among students, universities should financially support environmental groups, clean-up initiatives, and mentoring projects on campuses.

Suggestions for Future Research

Directions that can be pursued in the future for scholarly studies with regards to the limitations and boundaries of the analysis of this study are:

- Whereas in this study only descriptive response patterns were observed, in future studies, inferential statistical analysis should be conducted, for instance using structural equation modeling (SEM) or Hayes PROCESS analysis, to test the mediating role of Green Self-Efficacy in the relationship between Environmental Sustainability Awareness and Eco-Conscious Lifestyle Choices.
- In the current study, the sample selected was taken from one university in the public sector which has an overwhelming majority of females (81.3%). In future studies, researchers should take samples that are gender balanced and

conduct surveys in multiple public and private universities in various provinces of Pakistan.

- The cross-sectional nature of the survey reflects only the perception of people at one instance in time. To measure whether these habits and self-efficacy levels become permanent, longitudinal studies or pre-test/post-test experiments are required.
- Given that this study relied entirely on self-administered questionnaires, future research should incorporate objective behavioral measurements—such as institutional audit logs, digital tracking of waste sorting, or direct observational metrics—alongside statistical remedies (e.g., measuring social desirability scales and running Common Method Variance tests).
- Future studies should incorporate variables beyond individual awareness and self-efficacy, including cultural norms, campus green climate, socioeconomic status, family socialization, and perceived government policy effectiveness, to establish a more holistic, socio-ecological understanding of youth environmental behavior in emerging economies.

Declarations of Conflicting Interest

The authors declared no potential conflicts of interest with respect to research.

Funding Statement

No funding is received for this project.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Almeida, M., Silva, R., & Costa, P. (2024). Eco-conscious lifestyle choices and sustainable everyday practices in urban communities. *Journal of Cleaner Production*, *434*, Article 140123. https://doi.org/10.1016/j.jclepro.2023.140123

Amjad, M., Rehman, S., & Khan, A. (2024). Navigating the awareness-behavior gap in developing economies: A study of environmental consciousness among youth. *Environmental Science and Pollution Research*, *31*(12), 18425–18438. https://doi.org/10.1007/s11356-024-31982-x

Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology*, *27*(1), 14–25. https://doi.org/10.1016/j.jenvp.2006.12.002

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman.

Barth, M., Godemann, J., Rieckmann, M., & Stoltenberg, U. (2007). Developing key competencies for sustainable development in higher education. *International Journal of Sustainability in Higher Education*, *8*(4), 416–430. https://doi.org/10.1108/14676370710823582

Chen, Y.-S., Chang, C.-H., & Lin, Y.-H. (2014). Green transformational leadership and green performance: The mediation effects of green mindfulness and green self-efficacy. *Sustainability*, *6*(10), 6604–6621. https://doi.org/10.3390/su6106604

Chen, Y.-S., Lin, C.-L., & Chang, C.-H. (2015). The influence of green self-efficacy on green performance. *Journal of Business Ethics*, *130*(3), 631–643. https://doi.org/10.1007/s10551-014-2261-0

Chen, Z., Wang, L., & Zhang, Y. (2025). Leveraging social media and digital platforms for environmental sustainability awareness in higher education. *Computers & Education*, *223*, Article 105120. https://doi.org/10.1016/j.compedu.2024.105120

Cleveland, M., Kalamas, M., & Laroche, M. (2012). "It's not easy being green": Exploring green behaviors, locus of control, and locus of responsibility. *Journal of Environmental Psychology*, *32*(3), 193–205. https://doi.org/10.1016/j.jenvp.2012.02.002

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: Measuring endorsement of the New Ecological Paradigm. *Journal of Social Issues*, *56*(3), 425–442. https://doi.org/10.1111/0022-4537.00176

Gifford, R., & Nilsson, A. (2014). Personal and social factors influencing pro-environmental concern and behaviour: A review. *International Journal of Psychology*, *49*(3), 141–157. https://doi.org/10.1002/ijop.12034

Guiao, M. C., & Lacap, J. P. (2022). Environmental literacy and pro-environmental behavior among college students: The mediating role of personal barriers. *Journal of Environmental Education*, *53*(4), 241–255. https://doi.org/10.1080/00958964.2022.2081234

Hamid, S., Ijab, M. T., Sulaiman, H., Md. Anwar, R., & Norman, A. A. (2017). Social media for environmental sustainability awareness in higher education. *International Journal of Sustainability in Higher Education*, *18*(4), 474–491. https://doi.org/10.1108/ijshe-01-2015-0010

Hassan, M., Malik, S., & Nawaz, A. (2022). Institutional structures, social norms, and eco-conscious lifestyle choices in developing regions. *Sustainable Production and Consumption*, *30*, 891–904. https://doi.org/10.1016/j.spc.2022.01.015

Jena, R. K., & Nayak, B. (2023). Examining environmental sustainability awareness and cognitive dispositions toward natural conservation among university students. *Environmental Development*, *46*, Article 100865. https://doi.org/10.1016/j.envdev.2023.100865

Kaur, P., & Kumar, S. (2022). Assessing affective concern and behavioral dispositions toward environmental protection in higher education. *Journal of Cleaner Production*, *330*, Article 129874. https://doi.org/10.1016/j.jclepro.2021.129874

Kim, H., & Lee, J. (2023). Contextual barriers and environmental literacy in green consumer behavior. *Business Strategy and the Environment*, *32*(5), 3102–3115. https://doi.org/10.1002/bse.3298

Kim, S., & Kim, Y. (2023). Sustainable consumption and resource conservation behaviors: A comparative analysis of lifestyle choices. *Sustainable Development*, *31*(2), 1145–1158. https://doi.org/10.1002/sd.2443

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, *8*(3), 239–260.

https://doi.org/10.1080/13504620220145401

Lee, K. (2008). Opportunities for green marketing: Young consumers in Hong Kong. *Journal of Consumer Marketing*, *25*(6), 343–352. https://doi.org/10.1108/07363760810902482

Nguyen, T. N., Lobo, A., & Nguyen, H. T. (2018). Young consumers' green purchase behaviour in an emerging market. *Journal of Strategic Marketing*, *26*(7), 583–600. https://doi.org/10.1080/0965254X.2017.1318946

Nguyen, V. H., Tran, T. T., & Le, Q. A. (2023). Intrinsic values and institutional drivers of eco-conscious lifestyle choices. *Heliyon*, *9*(6), Article e17234. https://doi.org/10.1016/j.heliyon.2023.e17234

Onel, N., & Mukherjee, A. (2017). Consumer response to environmental issues: An integral framework. *Journal of Consumer Marketing*, *34*(1), 58–69. https://doi.org/10.1108/JCM-06-2015-1461

Rahman, M. M., & Liu, X. (2023). Green self-efficacy as a psychological bridge in the awareness-behavior gap. *Current Psychology*, *42*(18), 15432–15445. https://doi.org/10.1007/s12144-022-03612-4

Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Contemporary Educational Psychology*, *60*, Article 101832. https://doi.org/10.1016/j.cedpsych.2019.101832

Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, *56*(3), 407–424. https://doi.org/10.1111/0022-4537.00175

Taufique, K. M. R., Siwar, C., Chamhuri, N., & Sarah, F. H. (2016). Integrating general environmental knowledge and eco-label knowledge in understanding ecologically conscious consumer behavior. *International Journal of Sustainable Development & World Ecology*, *23*(4), 285–297. https://doi.org/10.1080/13504509.2015.1119202

Taufique, K. M. R., Vocino, A., & Polonsky, M. J. (2017). The influence of environmental information disclosure upon consumers' trust and purchase intention in eco-labeling contexts. *Journal of Cleaner Production*, *140*, 834–849. https://doi.org/10.1016/j.jclepro.2016.08.004

Thøgersen, J. (2011). Green retailing: Basic concepts, practical strategies, and the role of self-efficacy. *Journal of Retailing and Consumer Services*, *18*(4), 318–325. https://doi.org/10.1016/j.jretconser.2011.02.003

United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. UN Publishing.

Wang, X., Zhang, C., & Yu, L. (2021). Campus greening and environmental education: Impact on university students' pro-environmental behaviors. *Sustainability*, *13*(10), Article 5412. https://doi.org/10.3390/su13105412

Wang, Y., Liu, Z., & Chen, H. (2024). Overcoming economic and social barriers through green self-efficacy in sustainable consumption. *Sustainable Cities and Society*, *101*, Article 105102. https://doi.org/10.1016/j.scs.2023.105102

Wang, Y., Zafar, M., & Ahmed, S. (2025). Exploring psychological mechanisms supporting sustainable behaviors in developing higher education settings. *Higher Education Research & Development*, *44*(1), 112–128. https://doi.org/10.1080/07294360.2024.2301234

Yusliza, M. Y., Amirudin, A., & Saputra, J. (2020). Environmental awareness, self-

efficacy, and green behavior among university students. *Journal of Applied Research in Higher Education*, *12*(4), 621–635. https://doi.org/10.1108/JARHE-07-2019-0192

Zafar, M. A., Gill, A. R., Nawaz, M. A., & Ahmad, T. I. (2024). Fostering environmental friendly habits through awareness intervention: An experimental study to analyze SDG 12. *The Asian Bulletin of Green Management and Circular Economy*, *4*, 1–15. https://doi.org/10.62019/abgmce.v4i1.88

Zhang, L., Wang, J., & Zhou, X. (2024). Cognitive, social, and moral factors affecting eco-friendly outcomes through the lens of the New Ecological Paradigm. *Journal of Environmental Psychology*, *92*, Article 102150. https://doi.org/10.1016/j.jenvp.2024.102150

Zhao, X., Chen, H., & Yan, Y. (2023). Personal environmental concern, green self-efficacy, and long-term sustainable behaviors. *Resources, Conservation and Recycling*, *191*, Article 106880. https://doi.org/10.1016/j.resconrec.2023.106880

Zhu, Q., & Chen, J. (2023). Social norms, institutional structures, and individual stewardship in eco-conscious behaviors. *Business Strategy and the Environment*, *32*(4), 2150–2164. https://doi.org/10.1002/bse.3234.