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Investigation of Environmental Attitudes: Implications to Sustainable Campus Waste Management

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ABSTRACT

The study aimed to learn more about the university's faculty, staff, and students' environmental attitudes and sense of responsibility. Delving into environmental attitudes helps to raise awareness about environmental issues and their consequences. By studying how the public perceives these issues, the researcher can identify gaps in knowledge and debunk any misconceptions that might hinder efforts to protect the environment. Descriptive-correlational and causal research methods were used in this study. A questionnaire for a survey was distributed to 350 participants spread throughout university offices. The study results revealed that most participants were women aged between 20 and 29, with over half of them displaying ecocentric tendencies. Implementing sustainable development curricula in universities can be a powerful tool for promoting positive attitudes, values, and behaviors toward the environment and sustainable development. Recognizing the important role these groups play can help shape our collective future and encourage us to take action to support and promote their efforts. The study also found that the respondents' educational attainment and environmental sentiments were the only significant factors correlated. Those with ecocentric perspectives are more likely to exhibit pro-environmental attitudes and behaviors than those with anthropocentric or less ecocentric worldviews. Ecocentrism emphasizes the importance of ecological integrity, leading to heightened concern about environmental issues and a strong connection to nature. Understanding the ecological connection encourages an ecocentric worldview, which is essential for building a sustainable future.

INTRODUCTION

The study of environmental attitudes involves examining an individual's thoughts and feelings toward the world one inhabits. It entails exploring one's values, beliefs, and actions concerning the environment. This type of investigation aims to reveal people's attitudes toward environmental concerns, the extent to which they prioritize them, and their willingness to embrace sustainable practices. As it is, more efforts have been geared toward sustainable practices but at times are to no avail. By delving into public attitudes towards environmental issues, awareness can be raised about their consequences. This enables researchers to identify knowledge gaps and debunk misconceptions hindering efforts to protect the environment. The resulting insights can be used to design impactful educational initiatives and campaigns that promote conservation, sustainable living, and responsible resource management. Ultimately, by increasing awareness and understanding of environmental attitudes, we can inspire individuals and communities to take meaningful action to safeguard the environment and tackle environmental challenges.

As esteemed educational institutions and knowledge hubs, universities possess a distinct opportunity to foster environmentally conscious attitudes and behaviors within their faculty, staff, and students. Essentially, an individual's mindset dictates their approach to environmental responsibility. Hence, waste management is increasingly seen as a social and environmental responsibility among higher education institutions, prompting their inclinations toward sustainable waste management practices (Matiiuk & Liobikien, 2021).

Today, psychologists and psychiatrists agree that egocentrism exists in all people, including adults and children. As posited by Kavun (2012), the inability to comprehend and consider information from others that conflicts with one's own experience can also be a symptom of egocentrism.

These days, dealing with solid waste is a big environmental challenge, and it affects everyone, including academic institutions (Peñaflor & Ong, 2022). To this end, solid waste management, the best strategy to decrease the effects of excessive trash is to abide by the guidelines provided in the Republic Act (RA) 9003, often known as the 2000 Act controlling the management of ecological solid waste. The enactment and implementation of this law's provisions are under the purview of several government organizations. Following RA 9003, the national government must continue to carry out awareness-raising and instructional campaigns about appropriate solid waste management in partnership with the DENR, CHED, and PIA. Furthermore, it highlights the integration of environmental subjects into the curricula at all educational levels, emphasizing waste management concepts in both theory and practice (Paghasian, 2017). This is deemed important to help curb attitudes.

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Understanding the perspectives of faculty, staff, and students in the University when it comes to the environment is the overarching objective of the research being conducted. It was then going to review their environmental perspectives through an understanding of the two significant moral responsibility theories: ecocentrism and egocentrism.

The University must strive to foster environmental consciousness and develop initiatives that recognize ecological protection as essential to bringing about societal transformation. Unquestionably, one of the school's biggest issues is its environmental attitude, which will have an impact on effective campus waste management. The quantity of waste generated daily increases in correlation with the annual expansion of both employee and student numbers. Moreover, reducing environmental footprints, and achieving effective waste management on campuses is essential for instilling in students a sense of responsibility and environmental stewardship and encouraging environmentally conscious behavior that may last beyond their academic careers (Brundiers & Barth, 2015). Zoleta *et al.* (2014) stressed that to achieve this, the environmental awareness of the community should be raised.

The research delved into the environmental attitudes of the University's faculty, staff, and students. The findings and results of this inquiry can provide useful insights to the school's administration as they develop policies and intervention programs that promote sustainable waste management practices within the institution. The study's results will be shared with the intended audience and eventually published as part of CMO 15, Series of 2019, ensuring that the output reaches those who require it.

Literature ReviewThe theory of ecocentrism holds that all living things have intrinsic worth and should be respected and protected. By embracing this paradigm shift, campuses are uniquely positioned to lead the way in promoting ecocentrism, or ecologically responsible practices that hold reverence for the environment. By exploring the implications of ecocentric theory, this study delves into the potential of integrating ecocentric principles into campus waste management strategies. It promotes harmonious and sustainable coexistence with nature and sees people as an integral part of the larger ecological system (Cryer *et al.*, 2017).

According to Luchs *et al.* (2015), people who adopt an ecocentric worldview are more likely to show higher care for the environment and engage in sustainable practices. The implementation of Sustainable Waste Management (SWM) sustainability on campus has significant potential for reducing municipal solid waste and serving as an example for the community. However, this is not the case for some institutions. Some still have not fully embraced the idea of responsibly managing their solid waste because of a lack of accountability. Understanding the attitudes of faculty, staff, and students toward environmental conservation and waste management is crucial for devising targeted interventions and policies that can foster a culture of sustainability on campus.

Research suggests that individuals who prioritize the environment tend to take actions that support environmental conservation (Kopnina, 2017). As human-caused environmental issues continue to escalate, Goldman *et al.* (2013) emphasize the importance of incorporating environmental education that emphasizes an ecocentric mindset over an anthropocentric one. The theories of ecocentrism and egocentrism provide valuable insight into how individuals and institutions approach sustainability decisions.

The conceptual framework as shown in Figure 1 illustrates how specific variables, including demographic attributes (such as Age, Gender, and Educational Attainment) of the faculty, staff, and students at the University, along with their ethical tendencies (Ecocentric and Egocentric Behavior), impact their Environmental Attitude. This framework aims to understand how these variables impact waste management practices on campus. The objective of this assessment is to explore the environmental attitudes and perspectives of the faculty, staff, and students, thereby providing valuable support to the continuous sustainability endeavors in waste management throughout the campus.

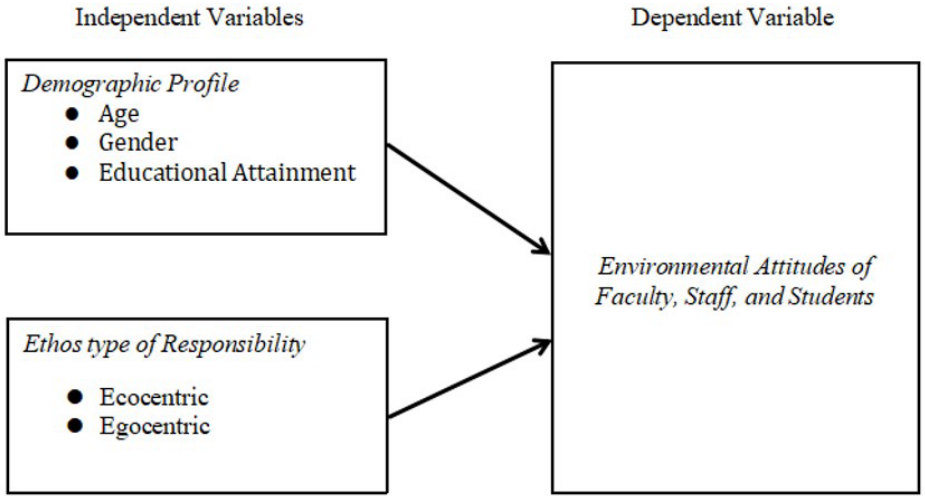

Figure 1: Interplay of the Independent and Dependent Variables

Numerous studies have linked pro-environmental beliefs and actions to ecocentrism. According to Luchs *et al.* (2015), people who adopt an ecocentric worldview are more likely to show higher care for the environment and engage in sustainable practices. Ecocentrism has also been linked to increased support for environmental action and conservation initiatives (Gifford & Nilsson, 2014). Ecocentrism's moral and ethical foundations encourage people to put the welfare of nature ahead of immediate human gains. Egocentric people are more inclined to put their interests and short-term advantages ahead of the environment's long-term health (Li *et al.*, 2017). The consumption of resources and environmental apathy may be higher among egocentric people (Schultz & Zelezny, 2016).

According to Miller *et al.* (2011), the participant's ability to maintain proper waste management depends on their age and gender. Individuals in their middle and later years participate more in waste separation and recycling activities. On the contrary, Madrigal and Oracion (2018), stressed that younger participants may be less receptive to information on SWM than older participants since they have less education and professional experience. From an environmental perspective, the same outcome was obtained. However, the same result was achieved with an environmental attitude.

Prior research conducted by Heyl *et al.* (2013) stressed the importance of integrating Environmental education into the curriculum. Hence, environmental education has become a powerful force, helping people, communities, and organizations understand the impact they have on the environment. It fosters a stronger sense of community and raises awareness about environmental issues, encouraging individuals to take action to protect our environment (Masongsong, 2023). Moreover, pro-environmental attitudes and behaviors have consistently been associated with higher educational achievement (Erdogan *et al.*, 2017).

The problem is rooted in people's attitudes and culture so the solution entails changing people's attitudes and culture.

Objectives of the Study

This study aimed to investigate the environmental attitudes among the faculty, staff, and students at the University. Specifically, it sought to determine the following:

(1) The profile of the respondents;

(2) The environmental attitudes and ethos type of responsibility towards environmental connectedness and solid waste management;

(3) Any significant difference in environmental attitudes among the faculty, staff, and students in the University and

(4) The variable that best predicts the environmental attitudes towards solid waste management, and

(5) The sustainable interventions can be carried out to improve the environmental attitude of faculty, staff, and students?

MATERIALS AND METHODS

Research Design

The study employed a descriptive-correlational and causal research approach to evaluate the impact of environmental perspectives on the attitudes of instructors, staff, and students at Liceo de Cagayan University.

Research Setting. The study took place at Liceo de Cagayan University, located by the scenic Cagayan de Oro River. With its main campus housing 26 different offices, the university's natural surroundings played a crucial role in shaping the attitudes of respondents toward the environment.

Participants and Sampling Procedure

The study utilized stratified random sampling to ensure the appropriate number of participants from each office and college. It involved 350 individuals, including academics, staff, and students from the university. The sample size was determined through computation and data analysis, to ensure that every unit in the population had an equal chance to be part of the study. The sampling method was utilized and selected to ensure that the results obtained from the sample were as close as possible to those obtained from monitoring the entire population.

Research Instrument

The researcher utilized a survey questionnaire developed by Magdale and Zoleta (2016), making modifications where necessary. The first part aimed to gather the respondents' demographic information, including age, gender, and educational background. The second part focused on evaluating the respondents' level of responsibility based on ethos, which indicates their environmental attitude. The final part aimed to ascertain whether there were any notable disparities in environmental attitudes among the respondents. The survey used a 5-point Likert scale, ranging from 1 for "Strongly Disagree" (indicating no awareness) to 5 for "Strongly Agree" (indicating high awareness), to structure its questions.

Validity and Reliability of the Instruments

To achieve the validity of the research instrument, the gathered questions were based on the literature readings and studies that are in the same category as this research. Since this study used a researcher-made instrument, the researcher conducted pilot testing to further attest to the reliability of the indicators. This study ensures the external validity of the population. To accomplish higher population validity, the subjects of this research are people from different demographic profiles.

Data Gathering Procedure

The researcher obtained authorization from the Dean of the College of Engineering - Graduate Studies through a formal permission letter to conduct the study. After completing the Reliability Test, the researcher submitted her paper to the ethics board for review. Data gathering was carried out following the standard protocol of the Ethics Board.

Statistical Analysis

The Statistical Package for Social Science (SPSS) software was used to interpret and analyze the data that were collected. The data collected in this study was analyzed using descriptive statistics such as frequency and percentage to classify the data and rank them in order. The mean and standard deviation methods were the mode of presentation of the data. In addition, the K-Wallis (Kruskal Wallis) compares the environmental attitudes among the respondents. The Regression Analysis predicts the variable that determines the ethos type of responsibility with the statistical test significance level set at .05.

RESULTS AND DISCUSSION

Objective 1. To Determine the Profile of the Study Participants

Table 1 presents the demographic characteristics of the respondents regarding age, gender, and educational attainment at Liceo de Cagayan University. As shown in the table (44.86%) of the respondents belong to the age bracket less than 20 years old, followed by (49.43%) belonging to the age bracket of 20–29 years of age, then (2.57%) fall in the age range of 30-49 years old, and lastly, (0.57 %) falls in the age range of 50 years old and above. Therefore, the age bracket between 20 and 29 years old dominates the entire population when it comes to the level of environmental attitudes toward campus waste management. Smith (2014), observed that individuals in the younger and middle age groups tend to view modern waste management practices positively owing to their increased awareness levels, they are also more receptive to embracing new technologies in the present era, as discussed in Chapter 2 of this study, which corroborated the findings.

Table 1: Demographic Profile Distribution of Respondents, | n = 350

Demographic Profile		**Frequency**	**Percentage**
Age	Less than 20	157	44.86
	20 – 29	**173**	**49.43**
	30 – 39	9	2.57
	40 – 49	9	2.57
	50 and above	2	0.57
Total		**350**	**100**
Gender	Male	123	35.14
	Female	227	64.86
Total		**350**	**100**
Educational Attainment	Student	322	92.00
	Faculty	7	2.00
	Staff	21	6.00
Total		**350**	**100**

At (64.86%), or 227 respondents, the gender distribution within the respondents was purely female. In contrast, of the 123 respondents in the total population surveyed, the males comprised (35.14 %) of the sample population. Accordingly, women are more ecologically conscious and responsible than men, as mentioned in Madrigal and Oracion's study in 2017. Likewise, Dung *et al.* (2017) validated those women exhibit significantly higher awareness regarding solid waste management compared to men.

Moreover, the results revealed that the majority of respondents, constituting 92.00%, were students, totaling 322 respondents. The university staff, comprising 6.00% of the sample with 21 respondents, and faculty members, accounting for 2.00% with 7 respondents. Consequently, Pizmony-Levy *et al.* (2013) found that as students' educational attainment increased, so did their pro-environmental attitudes in a study conducted in the United States. Other than that, the study's results show that a person's degree of education has a significant effect on their willingness to actively engage in environmental advocacy, meaning that universities have effectively taught students about the environment (Mullendore *et al.*, 2015). Hence there is high hope that educating through certain interventions can reverse results.

Objective 2. To Determine the Ethos Type of Responsibility in Terms of Ecocentric and Egocentric

The majority of respondents (51%) uphold ecocentric environmental attitudes towards the University according to the ethos type of responsibility. In this regard, research has demonstrated that ecocentrism reflects a strong bond with the environment and highlights the significance of maintaining the sustainability of our environment, which in turn boosts awareness of various environmental issues (Clayton, 2019). This aligns with Liu *et al.* (2022).

However, of the 350 respondents gathered from the data, 171 exhibit egocentricity, which contributes to (49%) of respondents' environmental attitudes. This suggests that

more efforts should be geared towards changing the attitude of these people to an ecocentric one. According to research conducted by Tseng and Wu (2021), individuals with more pronounced egocentric characteristics exhibit diminished environmental concern and are less inclined to engage in environmentally sustainable behaviors. This also agrees with the study of Choi and Lee (2022) as well as that of Gifford and Sussman (2012). They further emphasized that targeted educational interventions, as evidenced by Manikandan *et al.* (2017), can potentially reverse this effect.

Objective 3. To Determine the Environmental Attitudes of the Faculty, Staff, and Students in Terms of the Ethos Type of Responsibility Towards Environmental Connectedness and Solid Waste Management At Liceo De Cagayan University

Table 2 illustrates how respondents perceived their involvement in solid waste management and their connection to the environment at university. The findings indicate that in terms of their environmental connection, the average mean of 4.50, with a standard deviation of 0.64, falls within the realm of moderate awareness. The highest mean (4.76) falls in statement number 6, which states that "I believe that it is important to have high respect for the environment and its natural resources," followed also by statement number 7, with a mean of 4.69, which states, "I'm convinced that humans have a moral obligation to support conservation policies. It's time to take action," where both of these statements are interpreted as extremely aware. On the other hand, statement number 8, with the lowest mean of 3.92, states that "I'm a voice for the voiceless. Human interests can wait, but nature cannot" and was interpreted as moderately aware.

Table 2: Descriptive Statistics on Environmental Attitudes in Terms of the Level of Connectedness to the Environment at Liceo de Cagayan University, | n = 350

Connectedness to the Environment	Mean	SD	Interpretation
1. I believe that nature is important because of what it can contribute to the pleasure and welfare of humans.	4.68	0.55	Extremely Aware
2. Having a place to enjoy water-based recreational activities is one of the main reasons I keep lakes and rivers clean.	4.42	0.70	Moderately Aware
3. Natural resources are not commodities I can buy and sell; rather, they are a part of the nature I live with.	4.58	0.61	Extremely Aware
4. Nature provides me with perks and services that are essential for the well-being of all living things, including humans.	4.48	0.72	Moderately Aware
5. Even if it means reducing economic growth, I think that preserving the environment will be prioritized first.	4.42	0.70	Moderately Aware
6. I believe that it is important to have high respect for the environment and its natural resources.	4.76	0.50	Extremely Aware
7. I'm convinced that humans have a moral obligation to support conservation policies. It's time to take action.	4.69	0.54	Extremely Aware
8. I'm a voice for the voiceless. Human interests can wait, but nature cannot.	3.92	0.82	Moderately Aware
9. To achieve ecological balance, I have to maintain a healthy relationship with the environment.	4.59	0.60	Extremely Aware
Overall Mean	**4.50**	**0.64**	**Moderately Aware**

This implies that from the position of the respondents in implementing Sustainable Development curricula in the university, teachers, students, and staff as role models represent a significant factor in transmitting positive feelings, attitudes, values, and behavior towards and for nature/environment and sustainable development to their stakeholders and towards the fulfillment of Sustainable Development Goals 2030 that are set upon us.

Table 3: Descriptive Statistics on Environmental Attitudes in Terms of the Level of Solid Waste Management Awareness at Liceo de Cagayan University, | n = 350

Solid Waste Management	Mean	SD	Interpretation
1. The fact that recycling reduces the cost of environmental maintenance is one of its best features.	4.46	0.63	Moderately Aware
2. I am concerned about the environmental impact of waste on the university campus.	4.59	0.57	Extremely Aware
3. I am willing to help in reducing waste on campus.	4.59	0.57	Extremely Aware

4. The university's solid waste management facilities can help in discard my waste in a more manageable manner.	4.51	0.61	Extremely Aware
5. My trash taught me a hard lesson: waste isn't just "out there," it's a reflection of me, and I need to do better.	4.55	0.56	Extremely Aware
6. I have the assurance that small actions can make a big difference in reducing waste.	4.64	0.53	Extremely Aware
7. Hazardous waste has potential adverse effects on human health and the environment and needs to be properly disposed of.	4.64	0.54	Extremely Aware
8. I feel guilty when I dispose of waste materials that could still be recycled.	4.00	0.66	Moderately Aware
9. I believe my responsibility is to reduce waste to protect the environment.	4.61	0.56	Extremely Aware
Overall Mean	**4.51**	**0.58**	**Extremely Aware**

The statement with the highest average rating indicates the utmost importance of respecting the environment and its natural resources, it suggests that faculty, staff, and students at the University are more inclined towards ecocentrism, feeling a strong connection to the environment. These findings support Spirkin's (2016) research, showing that individuals with an ecocentric mindset are always mindful of nature's impact on the air they breathe, the water they drink, the food they eat, and the flow of energy throughout their daily lives. It also makes sense that humans cannot exist independently of nature because we have a genetic connection to it. It implies that the environmental argument holds that all living things have relations with one another, and this argument is related.

Moreover, table 3 indicates that regarding the respondents' environmental attitudes toward solid waste management, with an overall mean of 4.51 and an overall standard deviation of 0.58, they have been classified as extremely aware suggesting an impressive result. Table 5's statements 15 and 16 have the highest mean (4.64), emphasizing the data that respondents are highly aware of. However, statement number 17 was regarded as moderately aware, having the lowest mean of 4.00.

Objective 4. To Determine if There is a Significant Difference in Environmental Attitudes among the Faculty, Staff, and Students at Liceo De Cagayan University

Table 4: Kruskal Wallis results on the environmental attitudes and the demographic profile among the respondents at Liceo de Cagayan University, | n = 350

Factor	Grouping Variable	Level of Significance	K-Wallis Value	P-value	Result
Environmental Attitudes among faculty, staff, and students	Age	0.05	7.849	0.0973	Not Significant
	Gender	0.05	0.083	0.7728	Not Significant
	Educational Attainment	0.05	23.117	0.0001	Significantly Different

***K-Wallis is significant at the 0.05 level*

The findings in Table 4 indicate the results of the K-Wallis (Kruskal-Wallis) test concerning the significant disparity between the respondents' demographic characteristics and their environmental attitudes. The table indicates that for age, the calculated probability value (0.0973) surpasses the significance threshold of 0.05. This suggests that there is no notable distinction in the environmental attitudes among the respondents when categorized based on age groups. When considering gender, the data showed a probability value of 0.7728, which is higher than the significance level of 0.05. This indicates that there isn't a significant difference in environmental attitudes based on gender. Additionally, for educational attainment, the probability value (0.0001) is considerably lower than the significance level of 0.05. The findings indicate that environmental attitudes vary significantly depending on a person's educational level.

The outcomes, as shown in Table 4, align with Bedural's (2018) findings, suggesting that educational achievement significantly shapes individuals' values and perspectives regarding the environment. Similarly, individuals with higher levels of formal education typically have access to a wider range of information sources and types. Consequently, increased exposure to information enhances people's knowledge and awareness of the environment over time (Wen *et al.*, 2011).

Objective 5. To Determine the Variable that Best Predicts the Environmental Attitudes Toward Solid Waste Management

Table 5 presents the results of the multiple regression analysis. As gleaned from the table, it is educational attainment that predicts the ethos type of behavior, considering that the p-value of 0.001 is lower than the 0.05 significance level. On the other hand, age and gender do not have any significant effect on the dependent variable, as indicated by their p-values (0.564 and 0.290, respectively), which are way beyond the significance level.

The impact of education on our attitudes towards the environment cannot be overstated. According to a study by Bedural in 2018, people with higher educational attainment tend to hold more positive attitudes towards the environment and are more willing to participate in environmental initiatives than those with lower levels of education. This challenges the preconceived notion that individuals' attitudes toward the environment remain unchanged regardless of their educational background. As we look to create a more sustainable future for our planet, we must prioritize education and promote environmental awareness to inspire positive change and create a better world for generations to come.

This study strongly supports the notion that educated Filipinos exhibit more environmentally conscious attitudes and beliefs. While inadequate research has been done to examine the differences in environmental attitudes across various educational levels such as primary, secondary, and university education, the existing research suggests that environmental attitudes vary depending on the level of education.

Consequently, their understanding of environmental issues is anticipated to expand owing to increased exposure to information (Wen *et al.*, 2011).

A study conducted in the United States revealed that when people's education levels increase, they tend to have stronger pro-environmental sentiments (Pizmony-Levy *et al.*, 2023). It is believed that universities can be effective places to educate students about the environment because educational attainment is a strong predictor of people's propensity to participate in environmental activism (Mullendore *et al.*, 2015).

Table 5: Regression Analysis between Environmental Attitudes and the Demographic Profile of the Respondents, | n = 350

Predictors	Unstandardized Coefficient		Standard Coefficient	t	p
	B	SE B	ß		
Intercept (Constant)	78.740	1.080		72.886	.001
Age	-0.345	.597	-0.038	-0.577	.564
Educational Attainment	2.518	0.862	0.192	2.921	.004
Gender (2)	0.757	0.714	0.654	1.060	.290

Notes: R2 = .032 (p < .05), F-value = 3.865 p-value = 0.001, a.Dependent Variable: Environmental Attitudes Towards SWM
Source: Result of primary data processed using SPSS version 26.0 (2019)

CONCLUSIONS

The results of the study revealed that the majority of participants were women aged between 20 and 29, with over 50% of them displaying ecocentric tendencies. This highlights the urgent need for significant efforts to shift the remaining population's outlook towards a more ecocentric approach.

Based on the firsthand experiences of those who have implemented Sustainable Development curricula in universities, it is clear that teachers, students, and staff can serve as powerful role models in promoting positive attitudes, values, and behaviors toward the environment and sustainable development. In leading by example, these individuals can inspire their stakeholders to adopt a similar mindset, ultimately contributing to the achievement of the Sustainable Development Goals 2030.

Those who hold ecocentric perspectives are more likely to exhibit pro-environmental attitudes and behaviors than those with anthropocentric or less ecocentric worldviews. Therefore, understanding the ecological connection encourages an ecocentric worldview, which is essential for building a sustainable future.

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