




Information-Sharing as a Determinant of Pro-Environmental Behavior in the Student Population in Ghana

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Abstract

People have always struggled to find a lasting solution to the persistent problem of the management and segregation of waste. The amount and variety of waste produced globally has grown exponentially with the ongoing rise in human population. As a result, there have been several studies conducted in this field, some of which have been supported by private organizations, NGOs, and governments. To protect the environment while progressively achieving global sustainable development, Pro-Environmental Behavior (PEB) has been advocated as a universal endeavor for each individual. In affluent nations like the United States of America, the United Kingdom, and France, there is a lot of research on PEB. There is, however, a dearth of research on PEB in developing nations, the majority of which are found in Africa, where poor management and segregation of waste is a major problem.

Our goal with this study was to better understand how students at the University of Health and Allied Sciences in Ghana, a developing country, acquire and share knowledge on management and segregation of waste. Our study would provide further details on the main channels by which the student body communicates information about the environment. A chi-square analysis was done to ascertain the association among gender, academic level, and the students' garbage sorting. Ultimately, we investigated how students' attitudes or behaviors change after receiving thorough instruction on the significance of acting in an environmentally friendly manner. The following conclusions were drawn from the study: The association between a student's characteristics, such as gender and academic level, and their propensity to act in an environmentally friendly manner appears to be weak or even nonexistent. Also, a subsequent examination on students' garbage-sorting behaviors in relation to their academic level produced outcomes that were comparable to those of gender. The benefit of practicing PEB has been made clear to pupils, and we determined that they were ready to accept these standards after receiving this information.

Note: Data for this work is available and will be provided when requested.

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Keywords: *Pro-environmental behaviors (PEB), Metropolitan, Municipal and District Assemblies (MMDAs), Phi coefficient, Cramer's V coefficient, Contingency coefficient, Theory of Planned Behavior (TPB), The Norm Activation Model (NAM), Value Belief Norm (VBN), Theory of Reasoned Action (TRA)*

Date Submitted: April 17, 2022 | **Date Published:** November 27, 2023

Recommended Citation

Amengor, C., Agama, T., & Boapeah O. (2023). Information-sharing as a determinant of pro-environmental behavior in the student population in Ghana. *Journal of Social, Behavioral, and Health Sciences*, 17, 217–235.
<https://doi.org/10.5590/JSBHS.2023.17.1.15>

Introduction

The devastating nature of global environmental problems, such as climate change, biodiversity loss, global warming, and pollution, has threatened the existence of the human race as well as the environment (Steg & Vlek, 2009; Tezel et al., 2018). Ironically, these environmental problems are the consequences of nonsustainable human actions, such as overreliance on fossil fuels, bad farming practices, poor waste management, forest degradation, illegal mining, and many more (Hansmann et al., 2020; Steg & Vlek, 2009; Tezel et al., 2018). Environmental concerns have rekindled the interest in modeling human actions to become more sustainable not only to safeguard the environment but also to protect posterity (Onokala et al., 2018; Tonglet et al., 2004; Vicente-Molina et al., 2013). For instance, the Sustainable Development Goals seek to promote sustainable human actions across the globe and steer the world toward a sustainable future. Similarly, the African Union's Agenda 2030 seeks to promote sustainable human actions among Africans as a means to achieve sustainable development in Africa.

Sustainable human actions, which include but are not limited to the adoption of renewable energy sources, sorting of waste, recycling, afforestation, and practicing green farming, are considered manifestations of Pro-Environmental Behavior (PEB) (Eze, 2020; Gatersleben et al., 2014; Kollmuss & Agyeman, 2002; Nik Mat et al., 2020). As such, PEB is regarded as a universal individualistic effort to curb global environmental problems to safeguard the environment while gradually attaining global sustainable development (Tezel et al., 2018). Conceptually, PEBs are those human actions that are environmentally friendly. Kollmuss & Agyeman (2002) put it more succinctly as "behaviour that consciously seeks to minimize the negative impact of one's actions on the natural and built world." They suggest that PEB goes beyond actions that are friendly not only to the natural but also to the artificially built environment.

Our current study focused on the PEB of students at the University of Allied Health (UHAS), Ho, in Ghana, a developing country that is located in sub-Saharan Africa, precisely West Africa. According to the population and housing census conducted in 2020, Ghana has a population of 31,072,940 with the majority being women. Due to the increase in population, there is a higher tendency for an increase in waste production nationally. Therefore, the success of this project will serve as a template to curb the poor management of waste within the country.

Students at UHAS were targeted because it is a major institution in the country and more than 70% of the programs it offers are health related. We presumed that students in this category are inclined to be receptive to environmental issues and can easily adopt PEBs. The existing literature, most of which focuses on developed countries, reveals the importance of understanding the influencing factors that promote PEB (Chakraborty et al., 2017; Gatersleben et al., 2014; Hansmann et al., 2020; Kollmuss & Agyeman, 2002; Pichert & Katsikopoulos, 2008; Steg & Vlek, 2009; Tezel et al., 2018). Against this backdrop, our current study sought, in principle, to draw the synergies between PEB and information-sharing to promote a waste-sorting culture among students at the UHAS in Ghana. The novelty of our study lies in its contribution to

literature as investigating a population within a developing country and in making policy recommendations to improve waste-sorting culture and promote PEB.

Literature Review

The consequences of global environmental problems, such as climate change, depletion of the ozone layer, pollution, and biodiversity degradation have become dire as they potentially threaten human survival. Direct and indirect human actions that are unsustainable, such as overreliance on fossil fuels, bad farming practices, and poor waste management are largely known to cause these global environmental problems (Steg & Vlek, 2009). A paradigm shift in curbing environmental problems is modeling human actions and behaviors to become sustainable, which safeguards the environment. This transition from unsustainable actions and behaviors to sustainable ones is termed PEB (Kollmuss & Agyeman, 2002; Nik Mat et al., 2020; Vicente-Molina et al., 2013).

PEB involves the adoption of environmentally friendly lifestyles, such as sorting or segregating waste, disposing inorganic waste properly, recycling and reusing biodegradable waste, saving electricity, and others; these are actions that preserve the environment and conserve natural resources (Hansmann et al., 2020). PEB can also be defined as any human action, either direct or indirect, that is beneficial to the environment (Chakraborty et al., 2017). Among the numerous definitions of PEB, the most exhaustive may be that of Kollmuss & Agyeman (2002). In their study to examine the gap between the possession of environmental knowledge and environmental awareness and demonstrating PEB, they defined PEB as “behaviour that consciously seeks to minimize the negative impact of one’s actions on the natural and built world.” Their definition did not only consider the natural environment but also included the artificial environment of manmade structures, such as roads, schools, hotels, and estates.

Across the developed world, many empirical investigations have been conducted on PEB among students (Hansmann et al., 2020; Pichert & Katsikopoulos, 2008; Steg & Vlek, 2009; Vicente-Molina et al., 2013; Yusliza et al., 2020). However, not many studies have been conducted on PEB among students in Africa. In Ghana, to our knowledge, no studies have been conducted to investigate whether information-sharing influences PEB among students to sort or segregate waste as a measure to improve the recycling of waste. Hence, our study has bridged the knowledge gap in that regard and has made policy recommendations on what works to improve the sorting or segregation of waste and to promote PEB.

Sorting or Segregation of Waste

Management of municipal solid waste is a long-standing and a chronic problem in many Ghanaian cities (Owusu, 2010). Rapid urbanization has made it difficult for Metropolitan, Municipal, and District Assemblies (MMDAs) in Ghana to effectively collect and efficiently dispose of waste. Manifestly, large tons of unsegregated waste generated in these overpopulated cities daily are a major contributing factor. Indeed, Agbefe et al. (2019) revealed that MMDAs in Ghana have not integrated waste segregation at the source of generation as part of their waste management strategies, which would imply all types of waste—organic or inorganic—are collected together.

However, unsegregated waste is considered one of the major problems in managing municipal solid waste (Banga, 2013). In Ghana, it is estimated that 1.1 million tons of plastic waste items alone are generated annually and less than half are collected, while only approximately 5% is recycled (Economist Impact & The Nippon Foundation, 2021). A significant amount of plastic waste is mismanaged, which ends up in landfill sites and water resources (rivers, lakes, sea, etc.), while some is burned. The mismanagement of plastic waste is undoubtedly inimical to the environment as it increases the prevalence of biodiversity loss, emission of greenhouse gases, pollution, depletion of the ozone layer, and adverse climate change.

Unsegregated waste hinders the recycling of waste, which is considered one of the cheapest and most environmentally friendly mechanisms of waste management. This is because, for the process of recycling to commence, waste needs to be segregated. Hence, the sorting or segregation of waste at the source of generation is an essential starting point for waste to be recycled and reused. Our study sought to investigate the sorting or segregation of waste among students to enhance the prevalence of the waste-sorting culture, which is considered relevant for recycling to commence.

Theoretical Review

A host of studies conducted to explain the determinants or influencing factors of PEB adopted various behavioral models to explain significant environmental actions (Chakraborty et al., 2017; Hansmann et al., 2020; Vicente-Molina et al., 2013; Yusliza et al., 2020). Most notable among these behavioral theories are the Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), the Norm Activation Model, and the Value Belief Norm. Despite their individual flaws, all these behavioral theories have been used over the years to successfully predict the behavior of individuals to undertake specific and significant environmental actions. However, TPB is more relatable and has been used to explain the theoretical foundations of our current study.

The TPB by Ajzen (1991) is an extension of the TRA by Fishbein and Ajzen to better predict the actual behavior of individuals in multiple complex situations. This was due to the erroneous tenet of TRA that actual behavior is under one's volitional control. However, volitional behavior in realistic terms varies across different situations and geographical settings, such as that of our study, which is on a health-focused university in Ghana on the African continent. To correct this error, Ajzen introduced perceived behavior control, which will become one of the three main tenets of the TPB to predict the actual behavior of individuals.

The TPB, as a theoretical foundation to determine intended behaviors, posits that individuals have a rational basis for their behavior such that they consider the consequences of their actions (Tonglet et al., 2004). Further, variance in people's intended actions is explained by the difference in people's motivation and interest. This suggests that PEB among students, even in a health institution, may not be the same among all students. Our study acknowledged this variance that may occur in students' PEB and included the students' program of study as part of the key variables in explaining their PEB in relation to the sorting of waste. Again, a number of studies have revealed the correlation between course of study and PEB among students (Hansmann et al., 2020; Onokala et al., 2018; Tezel et al., 2018).

The TPB makes further assumptions that an individual's intended behavior is immediately determined by their intention to perform or not to perform that particular behavior. Ajzen (1991) referred to this as behavioral intention which, in turn, is influenced by attitude, subjective norms, and perceived control that together form the three main tenets of TPB. First, attitude—it is the extent to which an individual evaluates whether a behavior is favorable or unfavorable before performing it. Second, subjective norm—it is the extent to which an individual's behavior is influenced by perceptions of significant others, such as spouses, teachers, friends, and peers. Third, perceived control—it is the extent to which individuals perceive they can easily perform or not perform a particular behavior.

External factors to the model, such as past experience, personality, and demographic factors, may also influence behavior, but such influence is indirect, which is mediated through the components of the model. This suggests that the TPB gives room for external factors to be added to the model to explain variance in individuals' behavior. Thus, our current study has included information-sharing as an external variable to explain variance in PEB among students at the UHAS, in Ho, Ghana (see Figures 1 and 2).

Study Site

Figure 1. *Aerial View of the University of Health and Allied Sciences*



Figure 2. *Front View of University of Health and Allied Sciences*



Our study took place at the UHAS, in Ho, Ghana. This university was established in 2011 but did not begin operations until 2012. It has been operational for approximately 9 years, making it Ghana's youngest public university with a total student population of 3,752 and the best student-to-lecturer ratio (17:1) in the country. It has two major campuses situated in Ho and Hohoe, and it offers programs ranging from medicine to environmental sciences and sports science.

UAHS is primarily a health-related training institution with a curriculum focusing on health-related programs. This is why we selected it over the other universities under consideration; we expected that students at UHAS are better educated on good environmental practices so that they will be more inclined to embrace and adopt PEBs. Most of these students come from the surrounding regions, such as Greater Accra, Oti, Eastern, Ashanti, and in some cases, from the northern region. Approximately half of the students reside in hostel facilities provided by the school or private property owners.

Methodology

Criteria for Sampling and Size of Student Population

First, UHAS has a small student population, which actually helped in conducting an effective study. More than half of the student population resides in hostels. UHAS has the smallest student population when compared with the three main traditional public universities in the country, namely, The University of Ghana, Kwame Nkrumah University of Science and Technology, and the University of Cape Coast. The small population size helped us conduct a more detailed study and provided room for a smaller margin of error in our analysis.

Second, more than 60% of the students reside on campus. The main goal of this project was to study PEB among students. Thus, the targeted population was hostel students, making it easier to observe and gather data from them regarding how they sort their waste. Students who commute from their individual homes to school were quite difficult to study, because visiting them in their homes would have been time-consuming and extremely difficult. Retrospectively, our approach (focusing on students in hostels) was also certainly time-consuming and cost-intensive.

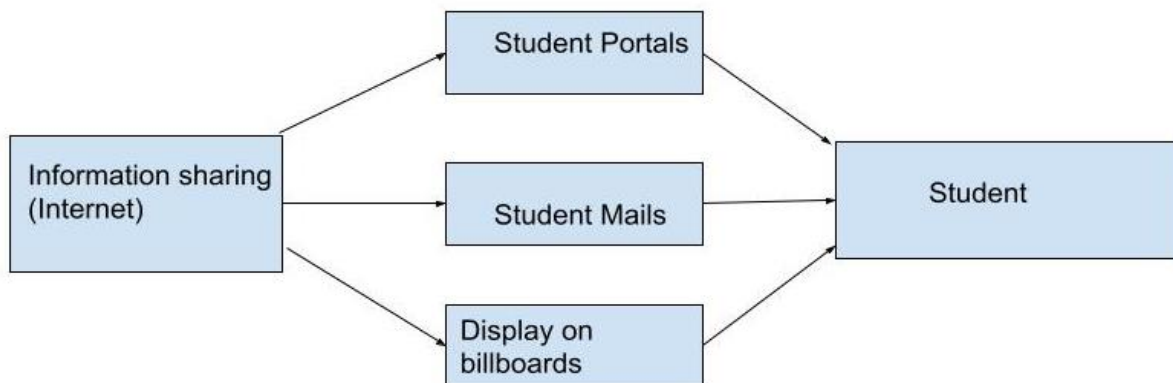
Finally, more than 70% of all courses offered at the UHAS are health-related; therefore, students were receptive to the call for pro-environmentalism and were apt to adopt PEBs as compared with students in other institutions. This proposition stems from the fact that most of the courses offered in these schools are focused on improving the environment in the areas of health, hygiene, and good sanitation practices. This profile undoubtedly qualified students in this category as the best group of students to focus on in our investigation.

Information-Sharing Within the Student Population

Information-sharing, as discussed in the introduction, is one major antecedent in ensuring PEB. According to studies conducted by Xiao et al. (2022) in China, one major efficient and effective approach to information-sharing is the use of the Internet. In their studies, they realized that due to the rapid popularization and extensive application of the Internet, individuals' lifestyles have also changed substantially (Xiao et al., 2022). In their major findings, Xiao et al. realized that the Internet, being the major hub for the sharing of environmental policies, has helped to increase individuals' PEBs. This approach was used as a major means of reaching out to the student population on the UHAS campus.

Figure 3 shows the three main approaches used to reach out to UHAS students on campus. The first section shows the sharing of information via the Internet, and then it moves through three main channels to the students, namely, student portals, their respective emails, and then displaying the information on billboards in the institution. These billboards are mounted at vantage points on campus so that, even without the use of the phone or computer, the student can get easy access to information regarding the clarion call to adopt PEB. Finally, the main consumer or the intended recipient (student) gets the information. The next part looks at administering questionnaires to the hostel students.

Figure 3. Flow Chart Depicting the Dissemination of Information Via Various Mediums Within the Population



Developing the Model

The two major approaches used involved the distribution and completion of questionnaires and conducting a detailed statistical analysis of the data using SPSS. Furthermore, for the questionnaires, we considered the six main hostel facilities and the total number of occupants in each room. The names of the hostels and number of students in each hostel are shown in Table 1 below. The hostels with the highest student occupancy had precisely 400 students; the hostel with the least occupancy had 115 students.

Table 1. List of Hostels

Names of Hostels	Student population (SP)
Trafalgar Medical Hostel	115
Dave Hostel	350
Defiat Hostel	400
SRC Hostel	200
MBMB Hostel	400
Edina Hostel	220

The total number of all students in the hostels is 1,685. This is a large population to study and the bigger the number, the higher the margin of error due to the increase in the variability of the population. So, the goal was also to involve a medium number of students, as it helped in providing us with a comprehensive analysis. We selected 500 students to respond to the questionnaires, which were evenly distributed among the hostels. We employed stratified random sampling since the population was divided into the number of occupants in a room. The next part looked at the number of people to select from each hostel. The sample size for each hostel was computed.

Trafalgar Hostel, Dave Hostel, Defiat Hostel, SRC Hostel, MBMB, and Edina Hostel

The hostels have room allocations with occupancy designated as one, two, four, or six students per room. Except for Defiat Hostel, which has only six students per room, the rest were mainly two or four students in a room. Based on the sample size for each hostel, we distributed among the rooms for each hostel. For instance, Trafalgar Hostel only has two and four students in a room; therefore, we tried to spread the number of students evenly from the sample population.: For Defiat Hostel, we have a sample population of 119 students and one-

four-, and six-room allocations. A similar approach was used to compute the number of individuals selected from each room. Also, it is presumed that rooms with a higher number of occupants are most likely to produce and/or dispose of a larger amount of waste. Table 2 below illustrates the distribution of room allocations.

Table 2. *Distribution of Room Allocations of the Selected Student Population*

Hostel names	Student population	Sample population	1 in a room	2 in a room	4 in a room	6 in a room
Trafalgar Hostel	115	34		5	6	
Dave Hostel	350	104	4	20	15	
Defiat Hostel	400	119	7		13	10
SRC Hostel	200	59	1	9	10	
MBMB Hostel	400	119	5	17	20	
Edina Hostel	220	65	1	12	10	

Data Analysis and Results

Demographic Analysis of Data

The statistical analysis began with the demographic analysis of the data obtained. This was followed by an evaluation of students about common environmental practices. The purpose of this technique was to determine whether students had been well informed about PEB. Finally, a chi-square analysis between gender and the sorting of waste was used.

Table 3. *Table Showing the Distribution of Gender and the Level of Study of Respondents*

Characteristics		Frequency	Percent (%)
Gender	Male	264	52.8
	Female	236	47.2
Level of study of respondent	Level 100	69	13.8
	Level 200	162	32.4
	Level 300	144	28.8
	Level 400	125	25.0

From Table 3, we saw that 264 participants in the study were men and 236 were women, which represents 52.8% and 47.2%, respectively. This shows little population discrepancy between both genders, as there were 28 more men than women. Furthermore, students were also divided into levels of study ranging from Level 100 to 400. The highest number of participants was at Level 200 followed by Level 300. The least number of students was at Level 100. During the collection of the data, all the traditional hostels of the university had only four in a room and six in a room. Subsequently, the privately owned hostels mostly provided accommodations for one and two in a room with a few hosting four in a room.

Evaluating Students' Knowledge on Environmental Protection Practices

Students in both the traditional and privately owned hostels were asked a plethora of questions on some common environmental protection practices to determine how much information they had on some key solutions for protecting the environment. The questions ranged from the contribution of waste disposal in

protecting the environment to the effective ways of getting rid of waste. The motivation for this approach was to gauge the impact of information-sharing on students' willingness to protect the environment. The results of the two major findings are displayed in Figure 4.

Figure 4. *Proper Disposal of Waste Helps to Protect the Environment*

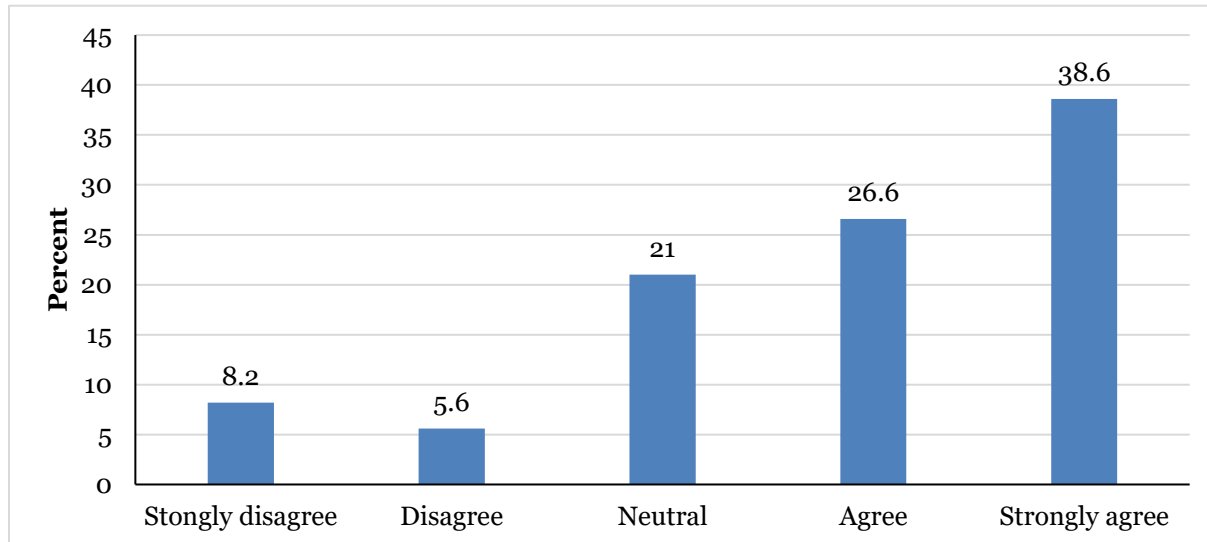


Figure 4 shows the responses of students with respect to the contribution of waste disposal in protecting the environment. There were five main categories of response: Strongly disagree, Disagree, Neutral, Agree, and Strongly agree. This gave students a wide range of options from which to select: 8.2% (41 students) Strongly disagreed, 5.6% (28 students) Disagreed, and 21% (105 students) remained Neutral. Furthermore, 26.6% (133 students) Agreed and 38.6% (193 students) Strongly agreed. Collectively, we have 34.8% (174 students) rejecting or ignorant or skeptical of the impact of waste disposal on the environment. Although the majority of the surveyed students (65.2% or 326 students) recognized the impact of waste disposal on the environment, it was still surprising to have such a significant number of students rejecting its importance. Our survey outcome could have been influenced in many conceivable ways. One possible reason could be that UHAS, where the survey was conducted, offers mainly health-related programs, including environmental sciences, so that students are well informed with more effective sanitary practices other than “waste disposal” that might impact the environment in a strongly positive way. The current survey outcome could be different if it were conducted in a different institution, i.e., not necessarily a health-based institution.

Figure 5 represents the responses of students when asked about the reuse of plastic to reduce pollution. We found that 7.2% (36 students) Strongly disagree, 6.6% (33 students) Disagree, and 23.2% (116 students) remained Neutral. Additionally, 30.4% (152 students) Agreed and 32.6% (163 students) Strongly agreed, respectively. Therefore, 185 students (37%) either Disagreed or remained Neutral, and 315 students (63%) gave a positive response. One major example of recycling plastics that was suggested to the students after the study was that they reuse their plastic beverage containers for storing food in the refrigerator as a means of reducing pollution which, in the long term, can protect the environment. The majority of the students agreed while others argued that these plastic containers would be disposed of in the long run, hence, keeping them does not make much difference. This shows that given adequate access to good information on pro-environmental behavior and the time to reconcile with those practices, students can make well-informed choices on being pro-environmental.

Figure 5. *Reusing Plastics Can Help Protect the Environment*

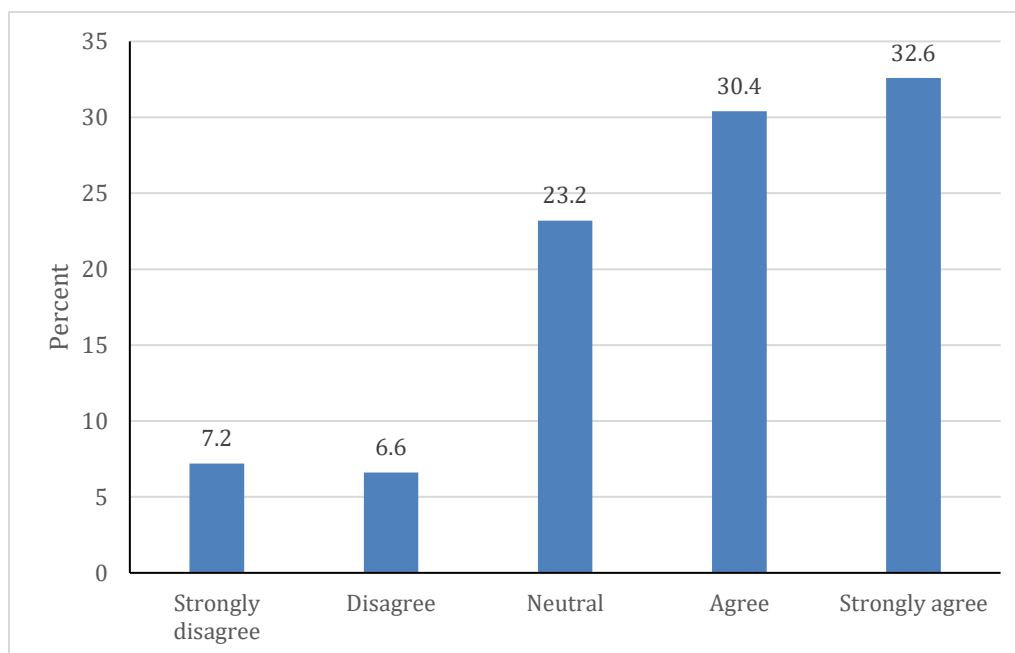
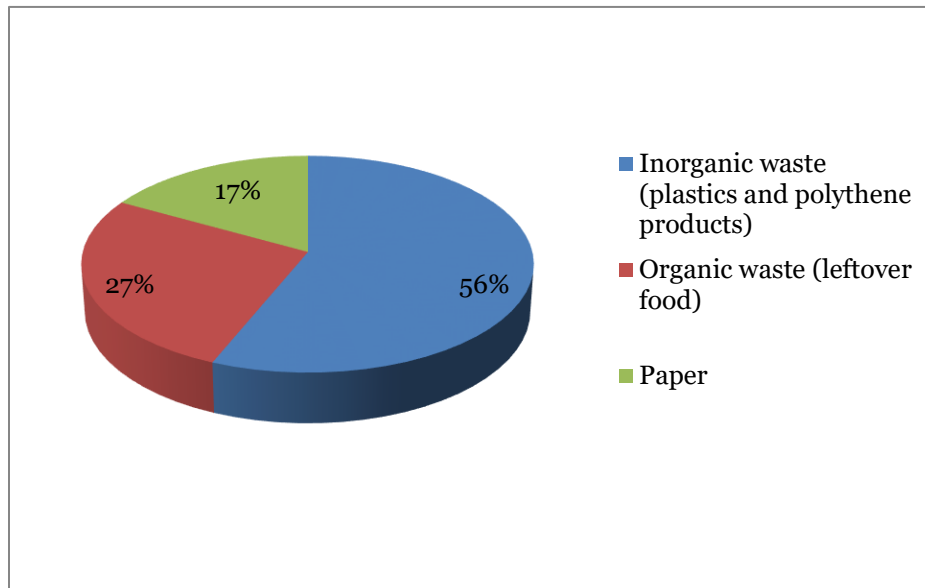
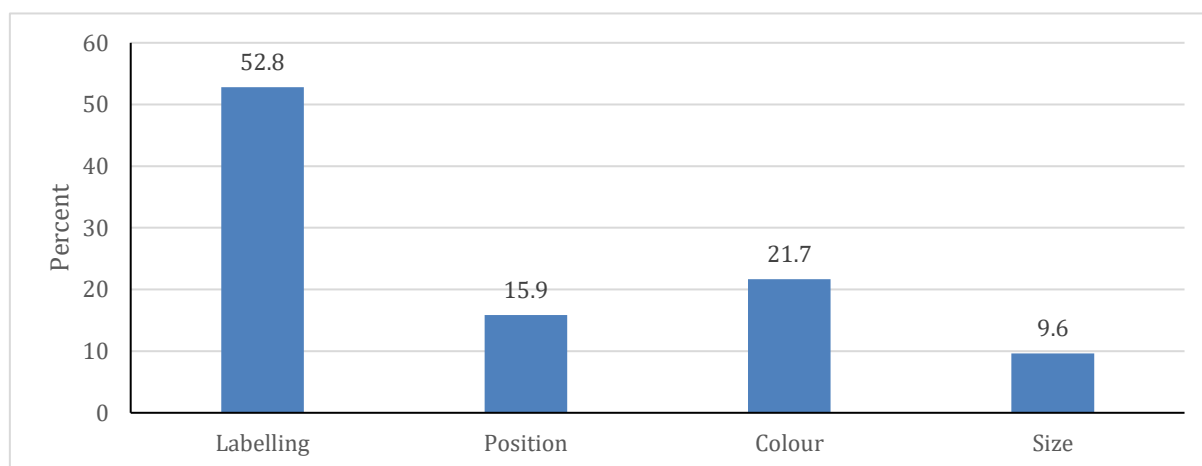


Figure 6. *Classification of Waste Substances*

The comprehensive effort by the institution to share information to students has undoubtedly been very efficacious, as most of the students were able to realize that there are many classifications of waste and, in addition, which types of waste substances they produced in large volumes. Waste is most often categorized as inorganic, organic, and paper (Figure 6). Inorganic waste comprises mostly plastic containers and polythene products, whereas organic waste, where the focus was, consists mainly of leftover or spoiled food substances. Of these three main categories, inorganic waste recorded the highest percentage at 56%, followed by organic waste with 27%, and 17% for paper. In this sense, we recommend the provision of at least two bins for most rooms. This approach would not merely provide rooms with extra bins but will mitigate the frequency of disposal of waste substances and ease the unpleasant stench of the waste products. The next step is determining the best approach to employ in identifying the waste bins by the hostel students.

Figure 7. *Identifying Waste Bins by Four Main Approaches*

The identification of the bins is a vital part of sorting out waste and its disposal. Students are mostly reluctant in checking for the specific bins for disposal if they are not well labeled. Four main criteria were considered: proper labeling, positioning/placement at vantage points, specific coloring, and the size of each bin (see

Figure 7). From the survey, 52.8% (264 students) selected labeling followed by 21.7% (109 students) in favor of coloring as a means of identification. Also, 15.9% (80 students) preferred the positioning of the waste bins at vantage points. Finally, only 9.8% (48 students) felt the size of the bins was important. The idea was that inorganic waste, which is produced most, should be assigned to larger bins, followed by organic waste assigned to medium-sized bins, and then paper, which is the least produced waste and which, in most cases, can be compressed, should be assigned to the smaller bins. It was surprising that students preferred a labeled bin to a brightly colored bin for sorting out waste. One possible reason for this preference could be that students feel a labeled bin could be a viable and time-saving approach for identifying the waste category. On the contrary, the second highest-ranked percentage of students surveyed professed an interest in the color as a viable approach for bin identification. This category of students may feel that their assigned bins might lose their labels subject to turbulent wind and torrential rainfalls. The more guaranteed and lasting approach for easy identification, at least in their views, was via the color of the bins.

Chi-Square Analysis

The chi-square test is a statistical test that only measures associations between categorical variables. It is employed in our study to measure the level of association between gender and the sorting of waste with the provision of dustbins and the level of study against the sorting of waste with the provision of dustbins. This helps us to study the willingness of students to sort out their waste based on the breadth of information available.

Chi-Square Analysis of Gender Versus Sorting Out of Waste

Figure 8. Gender Versus Sorting Out Waste If Bin Provided

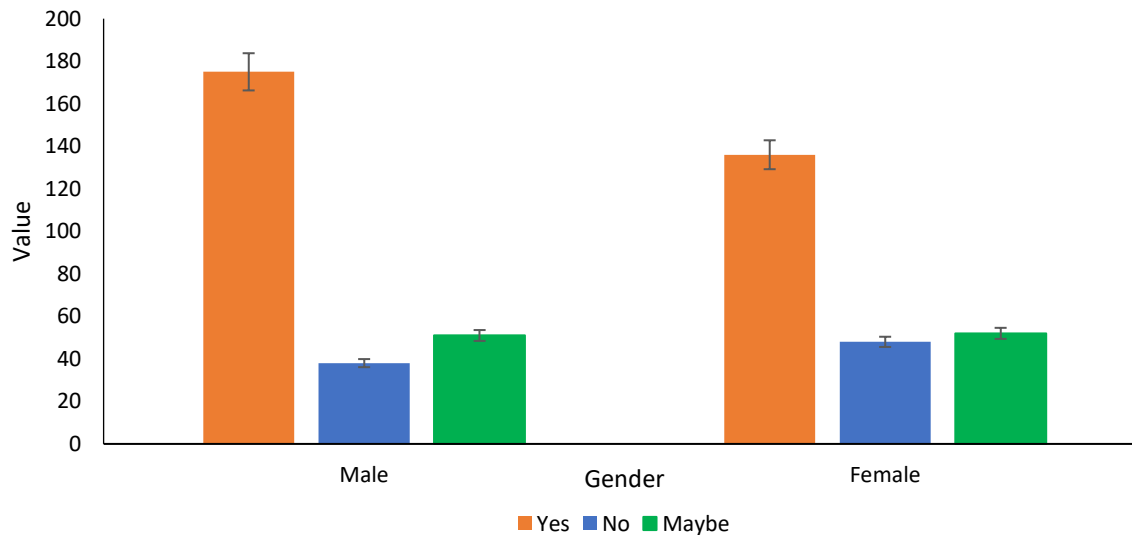


Figure 8 shows the representation of students' decisions on sorting their waste with the provision of waste bins. "Yes" was the majority decision of all genders with "No" ranking as the next highest and "Maybe" as the least. It was surprising that women did not record the highest number of Yes as according to research conducted by Vicente-Molina et al. (2018), women with science studies and high attitude levels are more likely to be pro-environmental. This could be explained in two main ways: There were more men than women in our study and this gave men the numerical advantage. Also, the factor of high attitude levels was not considered in our study.

Table 4. *Chi-Square Tests*

	Value	<i>df</i>	Asymptotic significance (2-sided)
Pearson Chi-Square	4.509 ^a	2	.105
Likelihood ratio	4.510	2	.105
Linear-by-linear association	2.457	1	.117
<i>N</i> of valid cases	500		

^a0 cells (0.0%) have expected count less than 5. The minimum expected count is 40.59.

The test relies on the two main hypotheses, namely, the null and alternate hypotheses. The null hypothesis, which is depicted as (**H₀**) states that there is no association between the two variables. The alternate hypothesis represented by (**H₁**) states there is an association between the two variables. In our case, the hypothesis was given as follows:

H₀: There is no relation between gender and the likelihood of sorting waste by students if provided with waste bins.

H₁: There is a relation between gender and sorting of waste by students if provided with waste bins.

From our analysis (Table 4), we realized that the *p*-value of 0.105 is greater than the significance level of 0.05; therefore, we fail to reject the null hypothesis (**H₀**). This suggests that there is not enough evidence to suggest a relationship between the two variables under study. Thus, men and women sort waste per their own discretion when provided with waste bins.

Testing for the Strength of Association

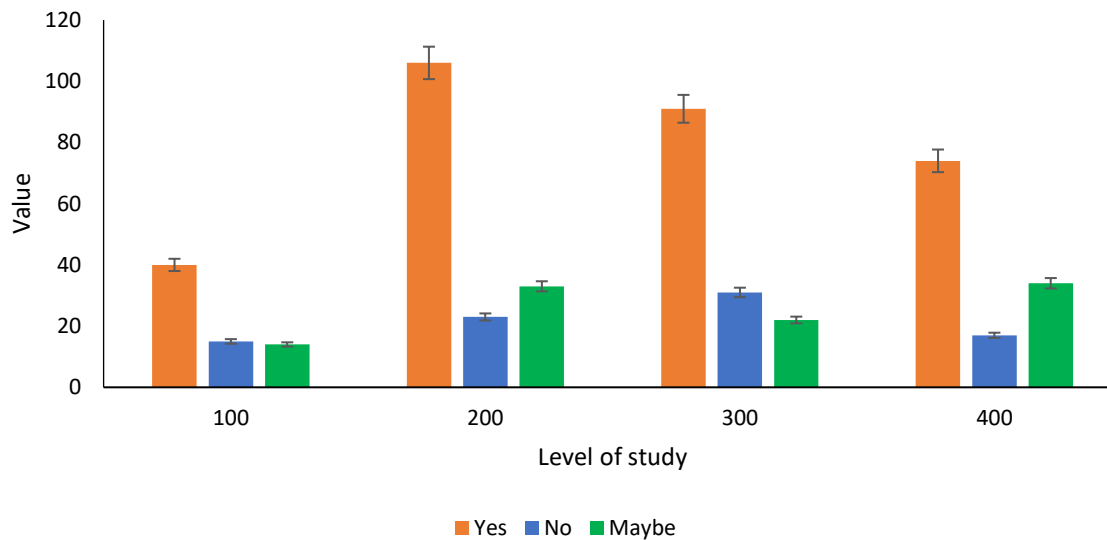
Table 5: *Symmetric Measures*

	Value	Approximate significance
Nominal by Nominal Phi	.095	.105
Cramer's V	.095	.105
Contingency Coefficient	.095	.105
<i>N</i> of valid cases	500	

From Table 5, we observe that the phi, Cramer's V, and contingency coefficient tests for strengths of association gave the same value of 0.095. According to the scale of measurement of the strength of association, values below 0.2 represent no association. This buttresses our earlier Pearson chi-square analysis, which showed that gender and sorting of waste were both independent of each other.

Chi-Square Analysis of Level of Study Versus Sorting Out of Waste

Similar to the previous analysis, we employed the same procedure in analyzing and interpreting our results (Figure 9).

Figure 9. Level Versus Sorting of Waste If Bin Provided

Akin to the Figure 8 showing gender versus waste-sorting behavior of students, the level of study versus sorting waste also had Yes as its majority response. The Level 100 students had the least number of Yes responses; this is mainly due to the fact that they had the smallest number of students. Also, Level 200, which had the highest number of students, recorded the highest number of positive responses.

Table 6: Chi-Square Tests

	Value	<i>df</i>	Asymptotic significance (2-sided)
Pearson Chi-Square	9.490 ^a	6	.148
Likelihood ratio	9.392	6	.153
Linear-by-linear association	.452	1	.501
<i>N</i> of valid cases	500		

^a0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.87.

Figure 9 illustrates the Level of study of students as against the responses obtained from the data collected. Table 6 provides a detailed chi-square analysis of the data.

H₀: There is no association between the levels of study against the sorting of waste by students when they are given waste bins.

H₁: There is an association between the two parameters.

The results are similar to the analysis on gender versus sorting of waste, as it was realized that the *p*-value is greater than the significance level; hence, we fail to reject **H₀** as there is minimal evidence to suggest a relationship between the levels of study and the sorting of waste by students. Therefore, the next step seeks to determine the strength of the association.

Table 7. *Symmetric Measures*

		Value	Approximate significance
Nominal by nominal	Phi	.138	.148
	Cramer's V	.097	.148
	Contingency Coefficient	.136	.148
N of valid cases		500	

Table 7 shows that, although the values of phi, Cramer's V, and contingency coefficient differed, their values were still less than 0.2. Hence, it can also be concluded that there is no association between the level of study and the sorting of waste habits of the students. This showed that the level of study cannot be classified as a main determinant for PEB.

The Impact of Information-Sharing (Internet) on PEB

The major means of sharing information, as outlined in the methodology section, was with the Internet. Students agreed to frequently use the Internet on a daily basis to get access to information. The majority stated that they preferred checking the student portal for any new information from the governing bodies of the school. In addition, some students preferred checking their student emails for information. Recently, the use of billboards has been one alluring approach employed by the school body to get information to the students. After informing and educating the students on being pro-environmental, we determined the response of these students to some vital pro-environmental practices.

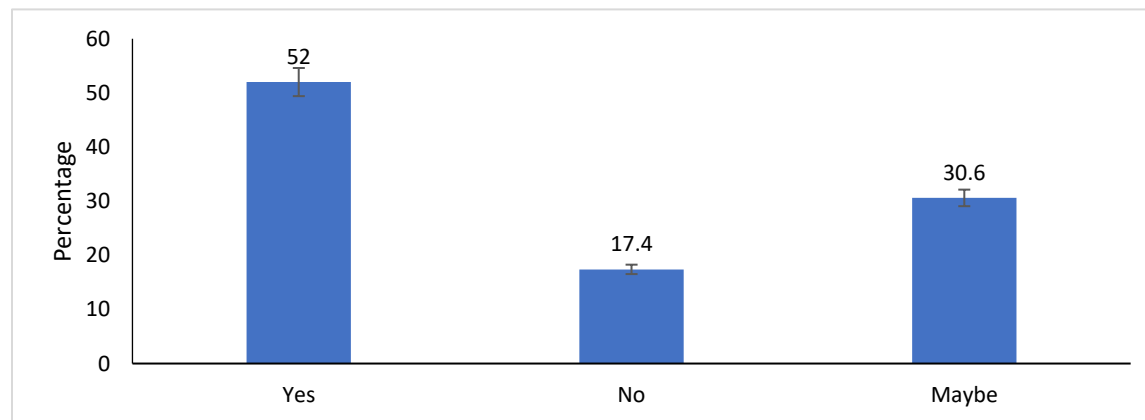
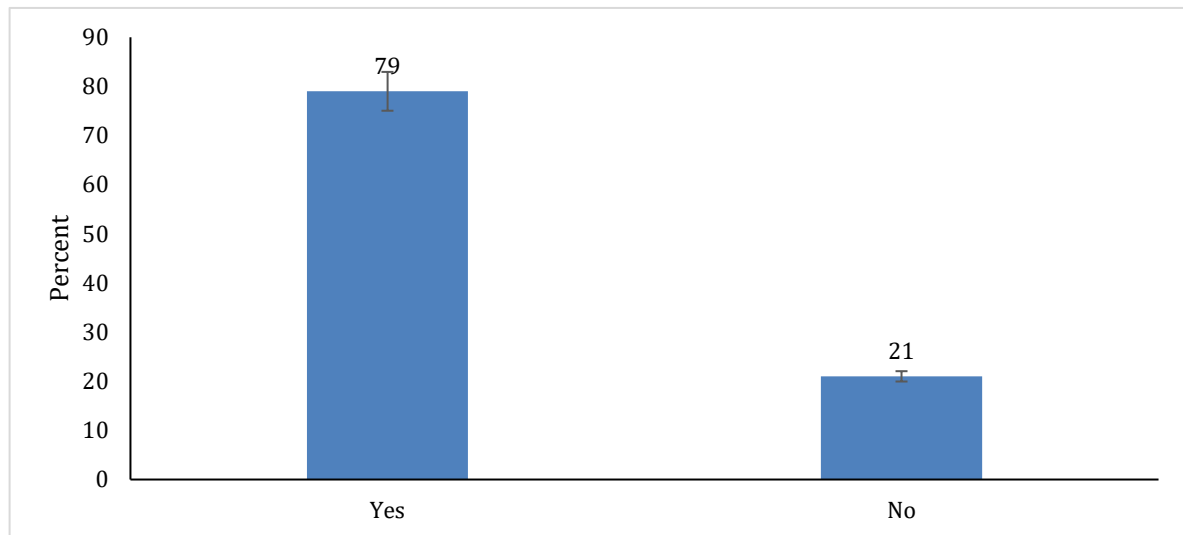
Figure 10. *Students Willingness to Carry Their Waste Bins to a New Hostel*

Figure 10 represents the response of students after they were well-educated and informed on the importance of being pro-environmental. It seeks to gauge the effect of an adequate use of information-sharing to reach out to the students. Works conducted by Pichert & Katsikopoulos (2008) determined that to study the impact of waste-sorting among individuals there are some vital characteristics for which to search. This includes the willingness of the individuals to carry their waste bin to their new settlement when they relocate. This approach was replicated in the student populace.

Therefore, if a student decides to move to another hostel and they carry their waste bins along, we assume that information-sharing was highly effective since they are willing to continue being pro-environmental with regard to sorting their waste. Subsequently, students who select No are regarded as those who are unlikely to be pro-environmental. Also, students who select Maybe can be regarded as either requiring more information to be convinced on practicing PEB or not interested.

Figure 11. Do You Think Having a Pro-Environmental Behavior Should Be One of the Requirement Considered for Job Selection?



A positive response was recorded with 52% (260 students) selecting Yes, 30.6% (153 students) selecting Maybe, and 17.4% (87 students) selecting the No option. Although the number of students who answered in the affirmative is in the majority, quite a large number of the respondents also selected Maybe and No. Therefore, we believe information-sharing within the population must be intensified to be able to obtain a higher value.

Figure 11 illustrates the views of students with regard to considering PEB as one of the key requirements used in assessing the conservatory skills of a job applicant. It is most likely that an applicant who is pro-environmental will be able to manage work resources such as electricity, water, and the environment, possibly due to the substantial amount of information acquired. Furthermore, an applicant who shows less regard for the call to be pro-environmental will probably mismanage resources which, in turn, can result in financial losses for the company. From the data given, we can ascertain that after students were educated on the benefits of observing PEB, they were willing to accept PEB as a requirement for a job offer. Some suggested that people applying for jobs are quizzed on some measures they take to keep their environment safe. This could be a great approach in helping minimize Ghana's chronic problem of environmental pollution.

Conclusion

The central theme of the current research has been to effectively gauge the impact of information-sharing on students' willingness to adopt PEB. As with any experiment, the current investigation was conducted assessing the behavior of students in embracing an environmentally friendly lifestyle with no presumption of access to prior information. We realized via the statistical tools employed that there is apparently a weak or possibly no relationship between the attributes of students (gender and level of study) and their inclination to adopt a PEB. This in some way serves as a control experiment to the actual investigation, where students in the aftermath were sensitized on pro-environmental lifestyles via the Internet and several other media. The result is quite suggestive, as there appears to be some sort of influence of information-sharing on the inclination of UHAS students to adopt a PEB. The influence may not appear to be profound; however, we presume the current study to be the first of its kind; there is still some room to obtain better and possibly significantly improved results when such a sensitization program is replicated in a very consistent manner, with a clarion call for the urgent need to adopt PEBs. Hence, in the not-too-distant future, we hope to conduct

similar investigations on a much larger scale, by which time the majority of students will presumably be well-informed and better poised to adopt a pro-environmental lifestyle. In line with the statement of William Pollard, “Information is a source of learning. But unless it is organized, processed and available to the right people in a format for decision making, it is a burden, not a benefit.”

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