Title: Information sharing as a determinant of pro-environmental behaviour in student population in Ghana.

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Abstract: Since the dawn of time, people have struggled to find a lasting solution to the persistent problem of waste management and segregation. The amount and variety of waste produced globally has grown exponentially along 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. In order to protect the environment whiles progressively achieving global sustainable development, Pro-Environmental Behaviour (PEB) has been advocated as a universal personal endeavour. In affluent nations like the United States of America (USA), the United Kingdom (UK), and France, there is a lot of research on PEB. There is, however, a dearth of study on PEB in developing nations, the majority of which are found on the continent of Africa, where poor waste management and segregation is a major problem.

The goal of this study is to better understand how university students at the University of Health and Allied Sciences (UHAS) in Ghana, a developing country, acquire and share knowledge on waste management and segregation. This will give further details on the main channels by which the student body communicates information about the environment. Also, it will allow us to do a chi-square analysis to ascertain the association between gender, academic level, and the students' garbage sorting. Ultimately, it investigates how students' attitudes or behaviours change after receiving thorough instruction on the significance of acting in an environmentally friendly manner. At first, the study gave more information about the effects of ineffective waste management and segregation.

Following this is a literature review that focuses on defining pro-environmental behaviour, which is followed by a methodology that describes the tools to be used in this study. 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 non-existent. Also, a subsequent examination on students' garbage sorting behaviour in relation to their academic level produced outcomes that were comparable to those of gender. The benefit of exhibiting a pro-environmental behaviour has been made clear to pupils, and it can be determined that they were ready to accept these standards after receiving this information.

Introduction

The devastating nature of global environmental problems such as climate change, biodiversity loss, global warming and pollution in recent times, threatens 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 unsustainable human actions such as over reliance 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). This has rekindled a new interest to model human actions to become more sustainable not only to safeguard the environment but to protect the existence of posterity (Onokala et al., 2018; Tonglet et al., 2004; Vicente-Molina et al., 2013). For instance, the Sustainable Development Goals (SDGs) seek to promote sustainable human actions across the globe and steer the world towards a sustainable future. Similarly, the African Union's (AU) 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 not limited to adoption of renewable energy sources, waste segregation, recycling, afforestation and green farming practices are considered as the manifestations of Pro-Environmental Behaviour (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 whiles gradually attaining global sustainable development (Tezel et al., 2018). Conceptually, PEB are those human actions that are environmentally friendly. Kollmuss & Agyeman (2002), puts it more succinctly as "behaviour that consciously seeks to minimize the negative impact of one's actions on the natural and built world". This suggests PEB goes beyond actions that are friendly not only to the natural but to the artificially built environment as well.

This current study focused on the pro-environmental behaviour of students in the University of Allied Health (UHAS), Ho, in Ghana. Ghana, is a developing country that is located in the sub-Saharan Africa precisely West Africa. According to the recent population and housing census conducted in 2020, it has a population of 31, 072,940 with majority being females. Due to the increase in population, there is a higher tendency of 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 of UHAS were targeted because it is the major institution in the country which offers well over 70% health related programs. Presumably, students of this category are inclined to be receptive to environmental issues and can easily adopt PEBs. The existing literature which are largely of developed countries reveal 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, the current study in principle sought to draw the synergies between PEB and information sharing to promote waste segregation culture among students of the University of Allied Health in Ghana. The novelty of this study lies in its contribution to literature and making policy recommendations to improve waste sorting culture and promote PEB.

The remainder of this study is structured as follows; the next section focuses on the literature review on PEB. The next focuses on the materials and methods of the study. This is followed by the presentation of results and discussion. Finally, we conclude the study and make policy recommendations.

1. Literature review

2.1 Pro-Environmental Behaviour

In recent times, the consequences of global environmental problems such as climate change, depletion of the ozone layer, pollution and biodiversity degradation has become dire as it potentially threatens human survival. Direct and indirect human actions which are unsustainable such as over reliance 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 modelling human actions and behaviours to become sustainable which safeguards the environment. This transition from unsustainable actions and behaviours to sustainable ones is termed as pro-environmental behaviour (Kollmuss & Agyeman, 2002; Nik Mat et al., 2020; Vicente-Molina et al., 2013).

Pro-environmental behaviour involves the adoption of environmentally friendly lifestyles such as waste sorting/segregation, proper disposal of inorganic waste, recycling and re-using biodegradable waste, saving electricity and others which preserves the environment and conserves natural resources (Hansmann et al., 2020). Also, it can be defined as any human action either direct or indirect which is beneficial to the environment (Chakraborty et al., 2017). Amongst the numerous definitions of pro-environmental behaviour, perhaps the most exhaustive is that of Kollmuss & Agyeman (2002). In their study to examine the gap between the possession of environmental knowledge and environmental awareness and demonstrating pro-environmental behaviour, they defined pro-environmental behaviour 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 man-made structures such as roads, schools, hotels and estates.

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

2.2 Waste Sorting/Segregation

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 waste. Manifestly, large tonnes of unsegregated waste generated in these over-populated cities daily are a major contributing factor. Indeed, Agbefe et al., (2019) revealed that MMDAs in Ghana have not integrated waste segregation at source of generation as part of its 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 plastic waste alone is generated annually and only under half is collected whiles only about 5% is recycled (Economist Impact & The Nippon Foundation, 2021). A significant chunk of plastic waste is mismanaged which ends up in landfill sites and water resources (rivers, lakes, sea etc.) whiles some are burnt.

The mismanagement of plastic waste is undoubtedly inimical to the environment as it increases the prevalence of biodiversity loss, emission of greenhouse gasses, pollution, depletion of the ozone layer and adverse climate change.

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

2.3 Theoretical Review

A host of studies conducted to explain the determinants/influencing factors of pro-environmental behaviour adopted various behavioural 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 amongst these behavioural theories include the Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB), the Norm Activation Model (NAM) and the Value Belief Norm (VBN). Despite their individual flaws, all these behavioural theories have been used over the years to successfully predict the behaviour of individuals to undertake specific significant environmental actions. However, TPB is more relatable and has been used to explain the theoretical foundations of this current study.

The Theory of Planned Behaviour (TPB) by Ajzen is an extension of the Theory of Reasoned Action (TRA) by Fishbein and Ajzen to better predict actual behaviour of individuals in multiplicity of complex situations. This was due to the erroneous tenet of TRA that actual behaviour is under one's volitional control. However, volitional behaviour in realistic terms

varies across different situations and geographical settings, such as that of this current study which is a health-focused university in Ghana on the African continent. To correct this error, Ajzen introduced perceived behaviour control which will become one of the three main tenets of the TPB to predict actual behaviour of individuals.

The TPB as a theoretical foundation to determine intended behaviours posits that individuals have rational basis of their behaviour 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 pro-environmental behaviour among students even in a health institution may not be same among all students. This study acknowledged this variance that may occur in student's pro-environmental behaviour and included the programme of study of students as part of the key variables in explaining students' pro-environmental behaviour in relation to waste sorting. Again, a number of studies have revealed the correlation between course of study and pro-environmental behaviour among students (Hansmann et al., 2020; Onokala et al., 2018; Tezel et al., 2018).

The TPB makes further assumptions that an individual's intended behaviour is immediately determined by his intention to perform or not to perform that particular behaviour. Ajzen, (1991) referred to this intention as behavioural intentions which in turn is influenced by attitude, subjective norms and perceived control which put together forms the three main tenets of TPB. First, Attitude: it is the extent to which an individual evaluates whether a behaviour is favourable or unfavourable before performing it. Second, subjective norm: it is the extent to which an individual's behaviour is influenced by perceptions of significant others such as spouses, teachers, friends and peers. Third, perceived control: it is the extent to which an individual perceives to easily perform or not perform a particular behaviour.

External factors to the model such as past experience, personality and demographic factors may also influence behaviour 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' behaviour. Thus, this current study has included information sharing as an external variable to explain variance in pro-environmental behaviour among students in the University of Health and Allied Sciences (UHAS), Ho, in Ghana.

2.4 Study site

Figure 1: Aerial view of the University of Health and Allied Sciences

https://www.ghanaweb.com/GhanaHomePage/NewsArchive/UHAS-will-produce-high-quality-health-practitioners-for-Ghana-Akufo-Addo

Figure 2: Front view of University of Health and Allied Sciences

https://www.uhas.edu.gh/en/about-us/overview.html

The study took place at the University of Health and Allied Sciences (UHAS), Ho in Ghana. This university was established in 2011, but did not begin operations until 2012. It has been operational for about 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 offers programmes ranging from medicine to environmental sciences and sports science.

However, it is primarily a health-related training institution with a curriculum focusing mainly on health-related programs, which is why it was selected over all the other universities under consideration since it is naturally expected that students there are better educated on good environmental practices so that they will be more inclined to embrace and adopt pro-environmental behaviour. Most of these students come from the surrounding regions, such as Greater Accra, Oti, Eastern, Ashanti - and in some cases - the northern region. Presumably, about half of the students reside in hostel facilities provided by the school or private property owners.

3. Methodology

3.1: Criteria for Sampling and Size of student population

Firstly, UHAS has a reasonably small student population - which actually helped in carrying out an effective study. More than half of the student population reside in hostels. UHAS has the least student population as 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 to carry out a more detailed study and provided room for a smaller margin of error in our analysis.

Secondly, more than 60% of students reside on campus. The main goal of this project was to study pro-environmental behaviour among students. Thus, the targeted population were primarily hostel students making it easier to observe how they sort their waste and gather data from them. Students who commute from their various 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 certainly time-consuming and cost-intensive.

Finally, over 70% of all courses offered at the university of health and allied sciences (UHAS) are health-related; therefore, students were receptive to the call for pro-environmentalism and were apt to adopt pro-environmental behaviours 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 area of health, hygiene, and good sanitation practices. This profile undoubtedly qualified students of this category as the best group of students to focus on in our investigation.

3.2 Information sharing within the student population

Information sharing as discussed in the introduction is one major antecedent in ensuring a pro-environmental behaviour. According to studies carried out by Xiao et al (2022) in China, one major efficient and effective approach of information sharing is with the use of the internet. In his studies, he realized that due to the rapid popularization and extensive application of the

internet, individuals' lifestyles have also changed substantially (Xiao et al). In his major findings, it was realized that the internet - being the major hub for sharing of environmental policies - has helped to increase the individuals' pro-environmental behaviour (Xiao et al). This approach is used as a major means of reaching out to the student population on the university of health and allied sciences (UHAS) campus. Figure 3 below, is a flow chart showing the dissemination of information within the student population.
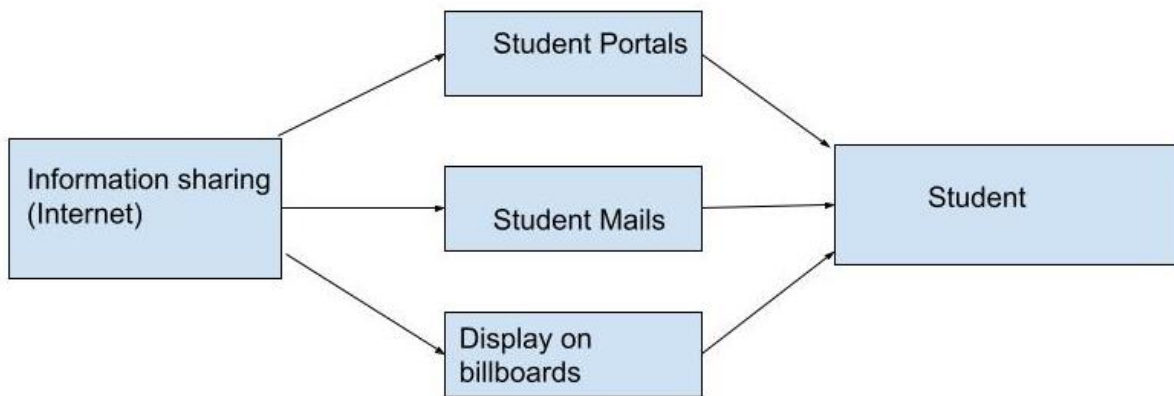

Figure 3: *Flow Chart depicting the dissemination of Information via various mediums within the population*

The flow chart above 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 pro-environmental

behaviour. Finally, the main consumer or the intended recipient [student] gets the information. The next part looks at administering questionnaires to the hostel students.

3.3 Developing the model

The two major approaches used involved the distribution and filling of questionnaires and carrying out a detailed statistical analysis of the data using SPSS. Furthermore - for the questionnaires - the 6 main hostel facilities and the total number of occupants in each room were considered. The names of the hostels are given in Table 1 below. The hostel with the highest student occupancy has precisely 400 students with the least occupancy having 115 students. This is shown in the table below.

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 table illustrates the hostel names with the respective number of students in those hostels. The total number of all students in the hostels is 1685. Evidently, this is a large population to work on, as 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 has helped in providing us with a comprehensive analysis. 500 students were selected to respond to the questionnaires which were evenly distributed among the hostels. This was where we employ stratified random sampling since the population is 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 is computed using: $sample\ size\ of\ hostel = \frac{SP}{N} \times n$. The subsequent

computations is given below: **Trafalgar Hostel** $= \frac{115}{1685} \times 500 = 34.12 \approx 34\ students$, **Dave**

Hostel $= \frac{350}{1685} \times 500 = 103.85 \approx 104\ students$, **Defiat Hostel** $= \frac{400}{1685} \times 500 = 118.69 \approx$

$119\ students$, **S.R.C Hostel** $= \frac{200}{1685} \times 500 = 59.347 \approx 59\ students$, **MBMB** $= \frac{400}{1685} \times$

$500 = 118.69 \approx 119\ students$, **Edina Hostel** $= \frac{220}{1685} \times 500 = 65.28 \approx 65\ students$.

Furthermore, the hostels have room allocations with occupancy designated as 1, 2, 4, and 6 in a

room. Except for Defiat hostel which has only 6 in a room, the rest were mainly 2 and 4 in a

room. Based on the sample size for each hostel, it is now distributed between the rooms for each

hostel. For instance, Trafalgar hostel only has 2 and 4 in a room allocation, therefore we try to

spread the number of students evenly from the sample population giving: $(2 \times 5) + (6 \times 4) =$

34. For Defiat hostel with a sample population of 119 students and one, four and six room

allocations, we have: $(7 \times 1) + (4 \times 13) + (6 \times 10) = 119$. 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 or dispose a larger amount of

waste.

The table below illustrates:

Table 2: Distribution of room allocations of the selected student population

Characteristics		Frequency	Percent (%)
Gender	Male	264	52.8
	Female	236	47.2

Names	population	Population	room	room	room	room
Trafalgar	115	34		5	6	
Dave Hostel	350	104	Level 100	20	15	13.8
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	

4. ANALYSIS AND RESULTS

4.1 DEMOGRAPHIC ANALYSIS OF DATA

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

Table 3: Table showing the distribution of gender and the level of study of respondents

respondent			
	Level 200	162	32.4
	Level 300	144	28.8
	Level 400	125	25.0

From the table, it can be seen that out of the data collected, 264 were Males and 236 were females which represent 52.8% and 47.2%, respectively. This shows little population discrepancy between both genders, as there were 28 more males than females. Furthermore, students were also divided into levels of study ranging from level 100 to 400. Level 200 recorded the highest number of participants followed by level 300. Level 100 recorded the least number of students. During the collection of the data, all the traditional hostels of the university had only: 4 in a room and 6 in a room. Subsequently, the private owned hostels mostly provided accommodation for 1 and 2 in a room with few numbers of 4 in a room.

4.2   EVALUATING STUDENT'S KNOWLEDGE ON ENVIRONMENTAL PROTECTION PRACTICIES

Students in both the traditional and private owned hostels were asked a plethora of questions on some common environmental protection practices to determine how much information they have had on some key solutions in 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 to students' willingness to protecting the environment. The results of the two major findings are displayed below in a bar chart.

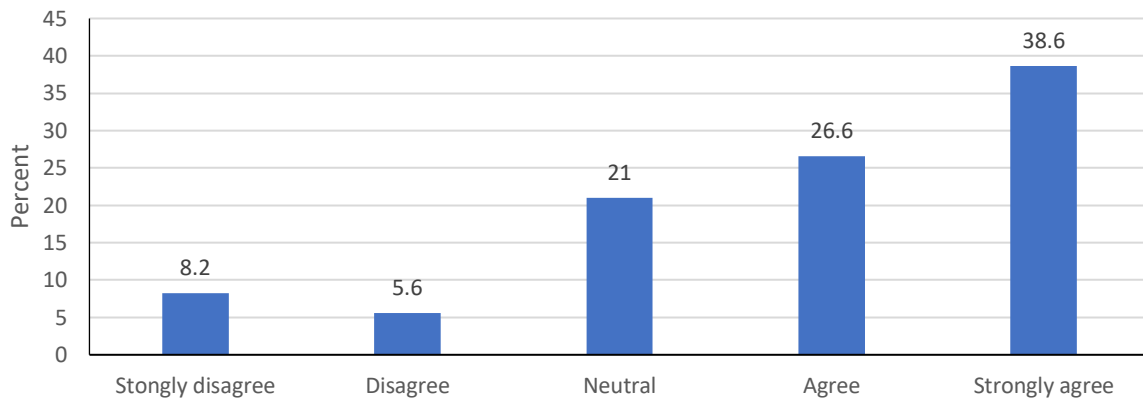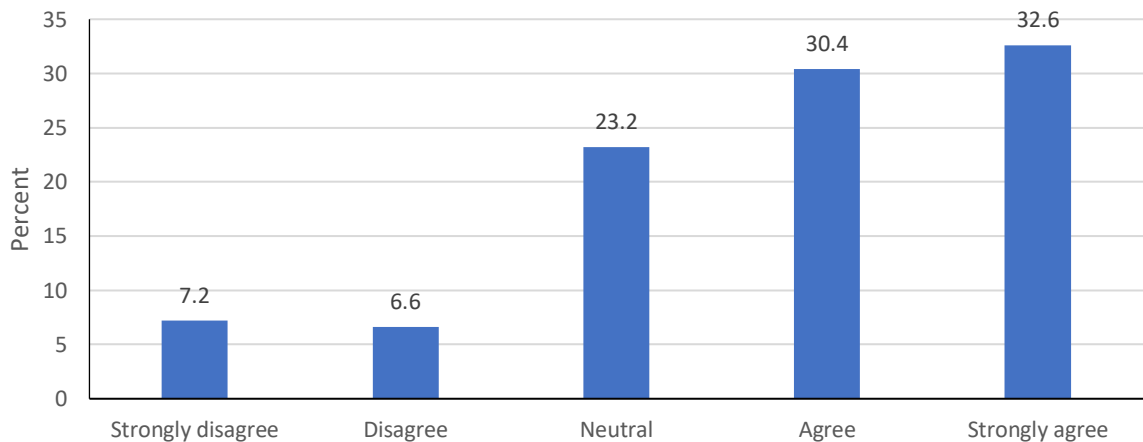**Figure 4**: Proper disposal of waste helps to protect the environment

Response	Percent
Stongly disagree	8.2
Disagree	5.6
Neutral	21
Agree	26.6
Strongly agree	38.6

Figure 5: Reusing plastics can help protect the environment

| Response	Percent
Strongly disagree	7.2
Disagree	6.6
Neutral	23.2
Agree	30.4
Strongly agree	32.6

The first figure shows the responses of students with respect to the contribution of waste disposal in protecting the environment. There are five main categories of response which are: Strongly disagree, disagree, neutral, agree and strongly agree. This gave students a wide range of options from which to select. In essence, 8.2% which represents 41 students strongly disagreed, 5.6% which represents 28 students disagreed and 21% representing 105 students remained neutral. Furthermore, 26.6% which corresponds to 133 students agreed and 38.6% corresponding to 193

students also strongly agreed. Collectively, we have 34.8% which stands for 174 students

rejecting or ignorant or possibly sceptical of the impact of waste disposal to the environment.

Although majority of the students surveyed, that is 65.2% (326 students), recognized the impact

of waste disposal to the environment - it was still surprising to have a significant number of

students rejecting its importance. The current 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 is a strongly positive way. The current survey outcome could

conceivably be different if it were carried out in a different institution - not necessarily a health-

based institution.

Subsequently, the pie chart below represents the responses of students when asked about the

reusing of plastic to reduce pollution. From the diagram, we have the following statistics: 7.2%

(36 students) strongly disagree, 6.6% (33 students) disagree and 23.2% (116 students) remained

neutral. Additionally, 30.4% representing 152 students and 32.6% depicting 163 students agreed

and strongly agreed respectively. This gives 185 students (37%) either disagreeing or remaining

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: The reuse of 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. Majority of the students agreed while others argued that these

plastic containers would be disposed in the long run hence keeping it do not make much

difference. This shows that given adequate access to good information on pro-environmental

behaviour and the time to reconcile with those practices, students can make well-informed choices on being pro-environmental.

Figure 6: Classsification of Waste substances
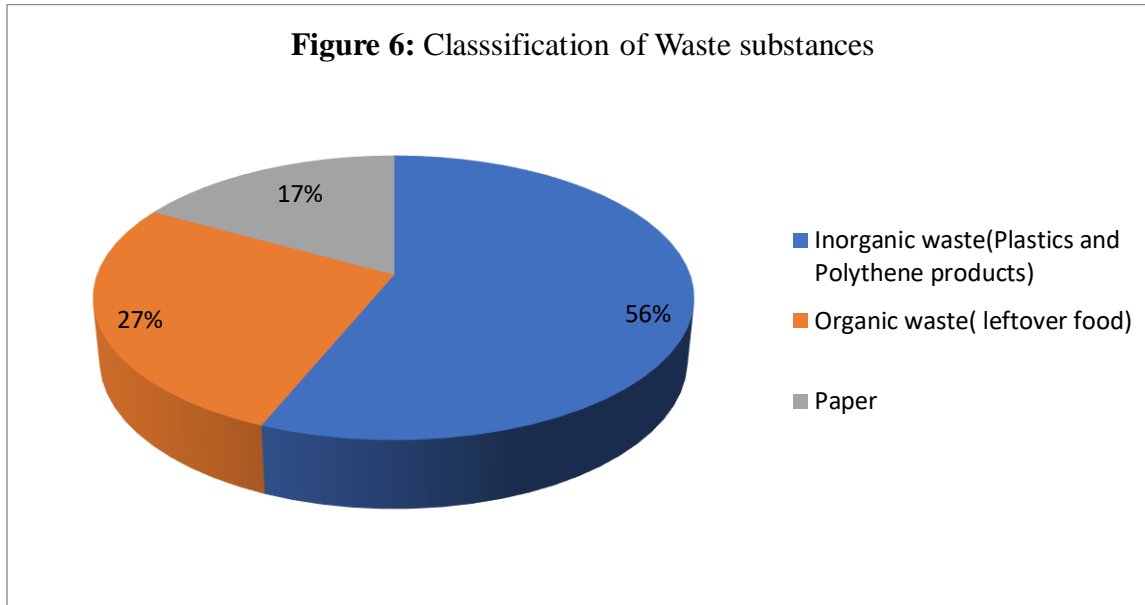
The comprehensive effort by the institution to share information to students has undoubtedly been very efficacious, as most of the students were able to realize that there are many classifications of waste and in addition, the type of waste substances they produced in large volumes. Waste is almost often categorized as inorganic, organic and paper. Inorganic waste comprises mostly of plastic containers and polythene products whereas organic waste - where the focus was – consist mainly of leftover or spoilt food substances. Out of these three main categories, Inorganic waste recorded the highest percentage of 56%, followed by organic waste with 27% and 17% for paper. In this sense, we recommend the provision of at least two bins to 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 wastebins by four main approaches
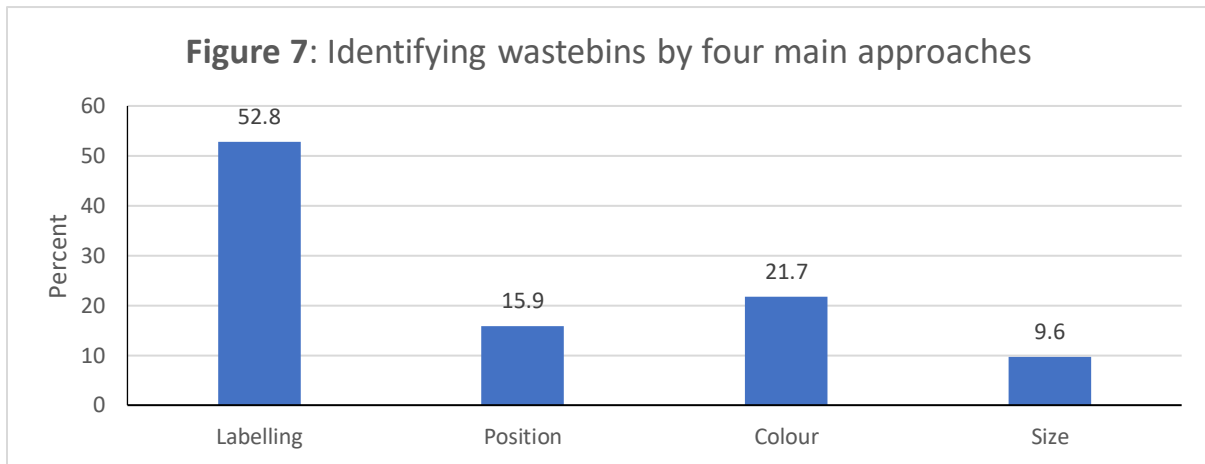
The identification of the bins is a vital part of sorting out waste and its disposal. Students are mostly reluctant in checking for the specific bins for disposal if it's not well labelled. Four main criteria were considered, which includes proper labelling, positioning/placement at vantage points, specific colouring and the size of each bin. Out of the survey, 52.8% representing 264 students selected labelling followed by 21.7% representing 109 students in favour of colouring as means of identification. Also, 15.9% which depicts 80 students preferred the positioning of the waste bins at vantage points. Finally, only 9.8% which stands for 48 students felt the size of the bins are important. The idea is that inorganic waste - which is mostly produced - should be assigned to larger bins, followed by medium-sized bins assigned to organic waste and then paper which is the least produced waste and which, in most cases can be compressed, is assign to the smaller bins. It was surprising that students preferred a labelled bin to a brightly coloured bin for sorting out waste. One possible reason for this preference could be that students feel a labelled bin could be a viable and time saving approach for identifying waste category. On the contrary, the second highest-ranked percentage of students surveyed professed an interest in the colour as a viable approach for bin identification. Conceivably, this category of students feels that their

assigned bins might possibly lose their labels subject to turbulent wind and torrential rainfalls. The more guaranteed and lasting approach for easy identification, presumably in their views, is via the colour of the bins.

4.3 CHI-SQUARE ANALYSIS

The chi-square test is a statistical test that only measures associations between categorical variable. It is employed to study the level of association between the following: Gender vs sorting out of waste with the provision of dustbins and Level of Study as against the sorting out of waste with the provision of dustbins. This helps us to study the willingness of students to sort out their waste based on the breath of information available.

4.3.1 CHI-SQUARE ANALYSIS OF GENDER VS SORTING OUT OF WASTE

Figure 8: Gender vs sorting out waste if bin provided
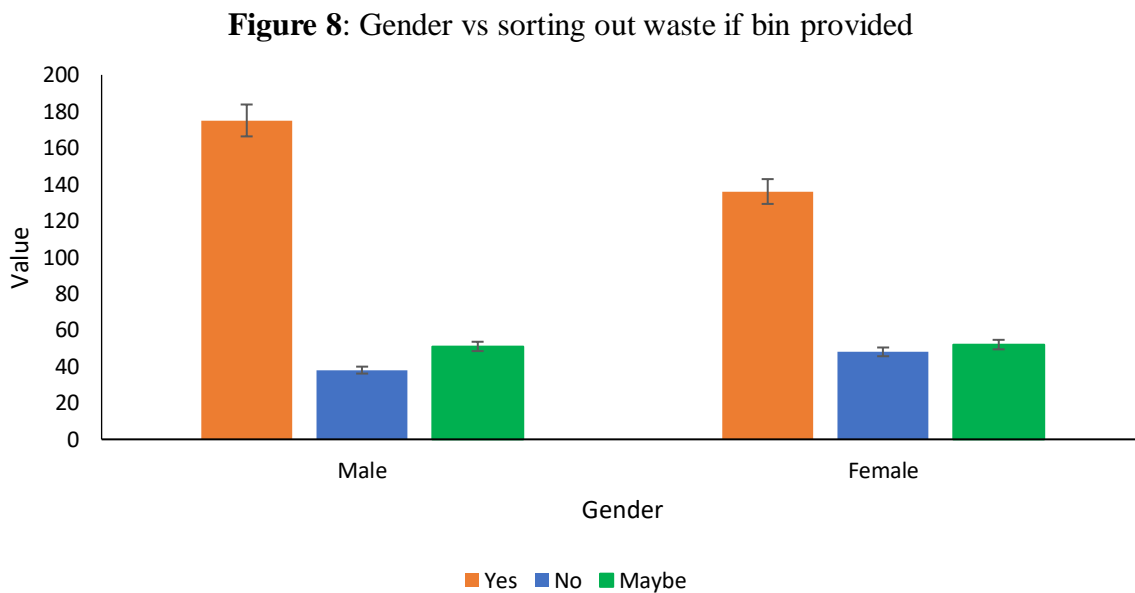
The diagram above shows the representation of student's decisions on sorting out their waste with the provision of waste bins. ''Yes'' was the majority decision of both genders with ''No'' ranking as the next highest and maybe as the least. It was surprising that females did not record

the highest number of yes as according to research carried out by Vicente 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 males that females and this gave males the numerical advantage. Also, the factor of high attitude levels was not considered in this article.

Table 4: Chi-Square Tests

	Value	df	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
N of Valid Cases	500		

a. 0 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 hypothesis. The null hypothesis which is depicted as (H_0) states that there is no association between the two variables. The alternate hypothesis represented by (H_1) states there is an association between the two variables. In our case the hypothesis given as follows:

H_0: There is a no relation between the gender and the likelihood of sorting out waste by students if provided with waste bins.

H_1: There is a relation between gender and sorting out of waste by students if provided with waste bins.

From our analysis, it was 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 (H_0). This suggests that there is not enough evidence to suggest a relation between the two variables under study. Thus, males and females sort out waste as per their own discretion when provided with waste bins.

4.3.2 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
N of Valid Cases		500	

From the table, it can be observed 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 out of waste were both independent of each other.

4.4 CHI-SQUARE ANALYSIS OF LEVEL OF STUDY VS SORTING OUT OF WASTE

Similar to the analysis above, we employed the same procedure in analysing and interpreting our results. The table of values is given below.

Figure 9: Level vs sorting out of waste if bin provided
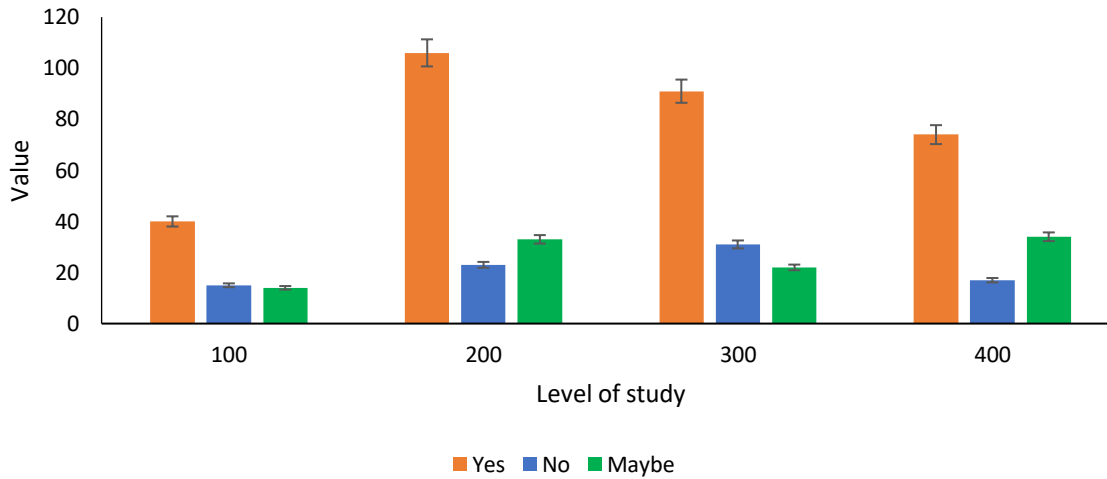
Akin to the earlier figure on gender vs. waste sorting behaviour of students, the level vs. sorting out waste also had yes as its majority response. The Level 100 students had the least number of yes, this is mainly due to the fact that they had the smallest number of students. Also, level 200 which had the highest number of students recorded the highest number of positive responses.

Table 6: Chi-Square Tests

	Value	Df	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
N of Valid Cases	500		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.87.

The initial table outlays the level of study of students as against the responses obtained from the data collected. Subsequently, the second table provides a detailed chi-square analysis of the data.

H$_0$: There is no association between the levels of study as against the sorting out of waste by students when given waste bins.

H$_1$: There is an association between the two parameters.

The results are similar to the analysis on gender vs. sorting out of waste, as it was realized that the p-value is greater than the significance level, hence we fail to reject **H$_0$** as there is minimal evidence to suggest a relation between the levels of study and the sorting out 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	

From the table, although the values of Phi, Cramer's V and Contingency coefficient differed, their values are still less than 0.2. Hence it can also be concluded that there is no association between the level of study and the sorting out of waste habits of the students. This shows that the level of study can't be classified as a main determinant for a pro-environmental behaviour.

4.5: The Impact of Information sharing (internet) on pro-environmental behaviour

The major means of sharing information as outlined in the methodology was with the internet. Students agreed to frequently using the internet on a daily basis to get access to information.

Majority stated that they preferred checking the student's 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.

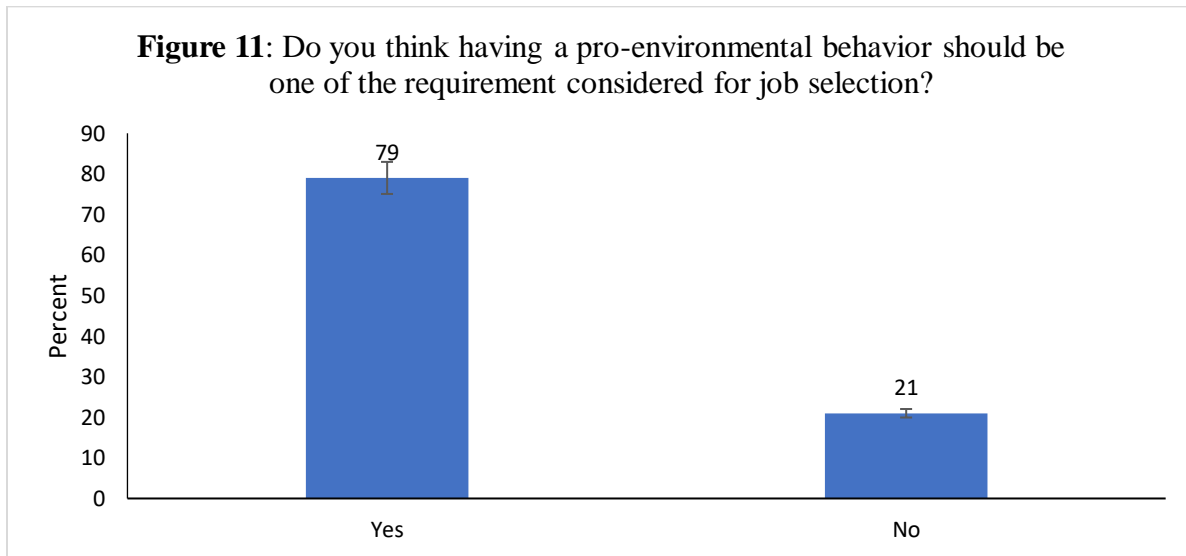**Figure 10**: Students willingness to carry their waste bins to a new hostel
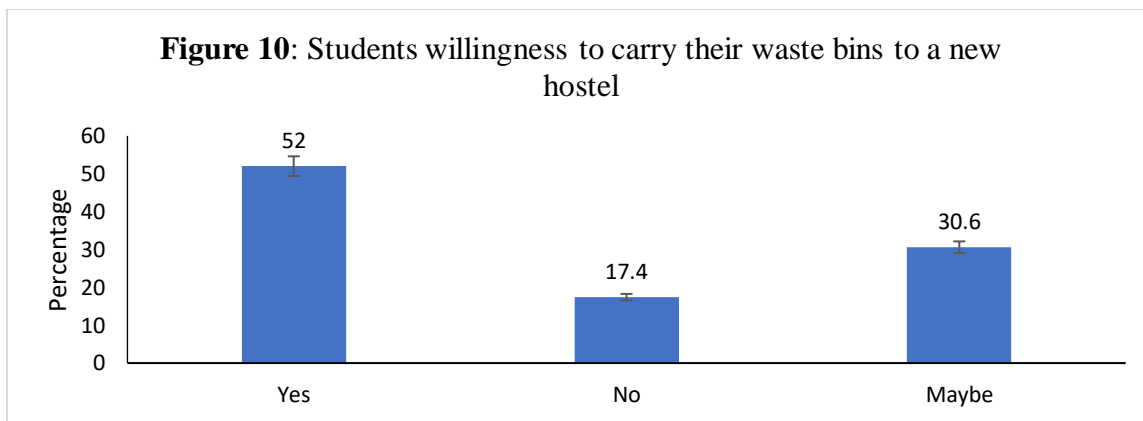
The bar chart represents the response of students after they were well educated and informed on the importance of being pro-environmental. It seeks to gauge the effect of an adequate use of information sharing to reach out to the students. From works carried out by Pichert et al (2008), it was determined that to study the impact of waste sorting among individuals, there are some vital characteristics to look out for. This includes the willingness of the individuals to carry their waste bin to their new settlement when they relocate. This approach is replicated on the student populace.

Hence if a student decides to move to another hostel and they carry their waste bins along, we would assume that information sharing was very effective - since they are willing to continue being pro-environmental with regards to sorting out 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 a pro-environmental behaviour or not interested.

A positive response was recorded with 52% (260 students) selecting yes, 153 students representing 30.6% selecting maybe and 87 students (17.4%) selecting the no option. Although the number of students who answered in the affirmative are in the majority, quite a chunk of the respondents also selected maybe and no. On these grounds, we believe information sharing within the population must be intensified to be able to obtain a higher value.

Figure 11: Do you think having a pro-environmental behavior should be one of the requirement considered for job selection?

The bar graph illustrates the views of students with regards to considering pro-environmental behaviour 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 good amount of information acquired. Furthermore, an applicant who shows least regard for the call to be pro-

environmental will most likely mismanage resources which in turn can result in financial loses for the company. From the data given, it can be ascertained that after students were educated on the benefits of observing a pro-environmental behaviour, they were willing to accept as requirements 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.

5. DISCUSSIONS

The current investigation continues an exhaustive study of the relationship between the disposition towards positive pro-environmental practices, waste management in our regime, and several attributes such as gender and level of study in the setting of an established health training institute (UHAS). Similar lines of investigation (Casaló & Escario, 2018) relating to gender and friendly disposition to the environment in terms of certain environmental practices had previously been carried out, except for differences in geographical settings (Germany and Ecuador) where the result mostly varied on a large scale.

On the contrary, our results indicate a minimal or no influence of gender on embracing waste management practices. This is mainly because gender cannot be solely considered as one of the main determinants for a pro-environmental behaviour. There are other factors that can be considered with gender such as attitude and family training. This finding can be backed up by the work done by Vicente et al (2018) on the role of gender in determining the pro-environmental behaviour of an individual. For instance, a well-informed male student on pro-environmental behaviour would be expected to practice it as compared with an incognizant female and vice-versa.

The follow-up analysis on level of study as compared with the waste sorting behaviour of students yielded similar results as that of gender. In practice a first-year student can be more informed than a final year student of the rewards of being pro-environmental. Inevitably, this would affect some of the decisions taken to protect the environment, so that the level of study cannot also be considered as a main antecedent for pro-environmental behaviour. However, it can be paired with information accessibility to give a good predictor of waste sorting behaviour among students. The current research appears to be more robust in terms of the number of various statistical tools employed. The setting is also gratifying in many ways, as it is an entirely health training institute so the result is presumably realistic as opposed to previous studies (Dornhoff, Sothmann, Fiebelkorn, & Menzel, 2019) carried out on high school students in Germany and Ecuador, where their knowledge on environmental health practices may not be as profound.

Hitherto, information sharing has continuously proven to be one of the major determinants in studying, predicting and influencing the pro-environmental behaviour of UHAS students. The major source of information being the internet due to its easy access is the most adequate means of educating students on pro-environmental practices. It can be realized from subsequent analysis that students appreciated the importance of cultivating pro-environmental attitude after they were well informed. This shows that more work can be done in terms of increasing information sharing among students, as it has been tested and proven more reliable and effective; Evidently, students suggested access to good information as the major means they could learn to be pro-environmental. This finding can be backed by the works of (Li, Zhaoc, Mab, Shaoe, & Zhang, 2010; Casaló & Escario, 2018; Lee, Kim, Kim, & Choi, 2014) in their various papers. A policy can therefore be devised to regulate the provision of bins by the waste management companies.

This policy would require providing multiple bins for students on campuses to sort out their waste. This would go a long way to curb the bad practices of waste disposal.

6. CONCLUSION

The central theme of the current research has been to effectively gauge the impact of information sharing on students' willingness to adopt pro-environmental behaviour. As with any experiment, the current investigation was conducted assessing the behaviour of students in embracing environmentally friendly lifestyle with no presumption of access to prior information. There it was 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 pro-environmental behaviour. 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 university students (UHAS) to adopt a pro-environmental behaviour. Albeit, the influence may appear to not be profound – presumably, the current campaign is the first of a kind - there is still some room to obtain better and possibly significantly improved results when such sensitization program is replicated in a very consistent manner, with a clarion call for the urgent need to adopt a pro-environmental behaviour. Hence, in the not-too-distant future, we hope to carry out similar investigation on a much larger scale, by which time 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".

7. Data Availability

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

8. Conflicts of Interest

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

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