

Does information sharing make a difference in pro-environmental behaviour? A study of university students' waste sorting behaviour at the hostel level

C. Amengor and T. Agama

Abstract: In this article we study the influence of access to information among UHAS students concerning the clarion call to be pro-environmental on their resolution to be attitudinally pro-environmental. We first examined the influence of gender and study level of UHAS students on their natural inclination to be pro-environmental, where there appears to be little or no influence. The influence became staggeringly profound when information sharing and accessibility component was introduced in our model. This underscores the impact of information sharing via various media on students (UHAS) disposition to adopt pro-environmental lifestyles.

1. Introduction

Given the current state of the environment (e.g., climate change, waste disposal, air and water pollution), researchers and policy makers argue that adopting and improving pro-environmental behavior is a necessary step toward a more sustainable society (Steg & Vlek, 2009; Spence & Pidgeon, 2010; Dornhoff, Sothmann, Fiebelkorn, & Menzel, 2019). The argument for adopting pro-environmental behavior has often proceeded with the intention of replacing existing unsustainable behaviors with sustainable ones, not only at an individual level but also on a collective level. In this regard, the central theme of studies and research has been on how to investigate the determinants of these pro-environmental behaviors and how to effectively promote sustainable solutions that ensure the integrity and well-being of the environment (Li, Zhaoc, Mab, Shaoe, & Zhang, 2010; Casaló & Escario, 2018; Lee, Kim, Kim, & Choi, 2014). Because pro-environmental behavior is diverse and has many causal influences (Stern, 2000), it is necessary to understand the determinants of behavior in order to effectively change human behavior that contributes to environmental problems (Heimlich & Ardoin, 2008; Steg & Vlek, 2009). In this study, we examine how information sharing, a determinant of pro-environmental behavior, influences the sorting behavior of university students at the hostel level.

Existing water conservation research (Ferraro & Price, 2013), energy-saving research (Costa & Kahn, 2013; Allcot, 2011), organic agricultural production (Thu, Tran, Goto, & Kawata, 2020), and hotel towel use behavior (Bohner & Schlüte, 2014) have converged on the idea that, information sharing represents one means of modifying behavior in individuals in order to reduce environmental impact. These studies raise the exciting possibility that information could be used to promote environmentally conscious behavior, in this case waste management, among university graduates as they go about their daily lives. The research topic is approached from the perspective that university students, who serve as the reference and geographical framework for this study, may be seen as future leaders and thus a source of inspiration for others (Zilahy & Huisinigh, 2009; Lozano, Lukman, Lozano, Huisinigh, & Lambrech, 2013). This is not to say that only university students have access to high levels of knowledge and top positions, but they are most likely the primary group that acquires the technical and specialized knowledge required to carry out appropriate decisions and solutions

for a more sustainable world. As a result, it is critical to identify what factors encourage them to behave pro-environmentally, in order to increase the effectiveness of pro-environmental interventions and policies implemented by universities and governments in the near future.

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, research is not quite on the level regarding pro-environmental behaviour among students in Africa. In Ghana, to the best of knowledge of the researcher, no research has 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 will in some way bridge the knowledge gap in that regard and make policy recommendations on what works to improve waste sorting/segregation and promotes pro-environmental behaviour.

The management of municipal solid waste is a long standing problem in many Ghanaian cities (Owusu, 2010). Rapid urbanization has crippled Metropolitan, Municipal and District Assemblies (MMDAs) in Ghana to effectively collect and efficiently dispose waste. This is due to large tonnes of unsegregated waste generated in these populated cities daily. Plausibly, 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. This means all types of waste either 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 while only about 5% is recycled (Economist Impact & The Nippon Foundation, 2021). The huge remainder of plastic waste is mismanaged which ends up in landfill sites and water resources (rivers, lakes, sea etc.) while some are burnt. The apparent mismanagement of plastic waste is 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 first step in any process for waste to be recycled and reused. This study seeks to investigate waste sorting/segregation among students to enhance waste sorting culture, which is very relevant for recycling to commence. Thus, this current study will include 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.

2. Study site

The study was conducted 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. It has a

total student population of 3,752 and has the best student-to-lecturer ratio (17:1) in the country. It has two major campus 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 chosen over all the other universities under consideration since it is naturally expected that students there will be better educated on good environmental practices so that they are more inclined to embrace and adopt pro-environmental behavior. 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 should reside in hostel facilities provided by the school or private property owners.

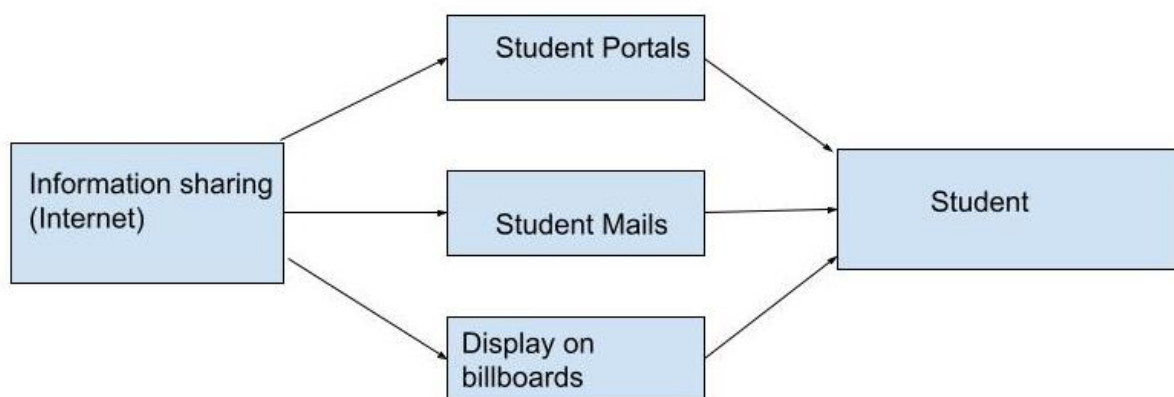
There were three main reasons why this institution was selected for the study.

Firstly, it has a limited number of students, which can be studied effectively. More than half the student population is in hostels, and it is the major health-related university in the country. 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 will help us do a more detailed study and also give us room for a smaller margin of error in our analysis.

Secondly, more than 60% of students have rented accommodations on and off-campus. The main goal of this project is to study pro-environmental behavior among students. This means that our target population will be hostel students so that we can easily observe how they sort their waste and gather data from them. Students who commute from their various homes to school will be difficult to study because it will be a time-consuming task that will require us to visit their homes. This would certainly be time-consuming and cost-intensive as well. Finally, over 70% of all courses at UHAS are health-related; therefore, we presume they will appreciate the need to be more pro-environmental as compared with other institutions. This is because most of the courses offered in these schools are focused on improving the environment such as health, hygiene, and good sanitation practices. Hence they will be the best group of students to focus on with regards to this study.

3. Methodology

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 is realized that the internet being the major hub for sharing of environmental policies, 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 UHAS campus. The flow chart below shows the dissemination of information within the student 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 to three main ways of reaching out 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 such that - even without the use of the phone or computer - the student can get easy access to information regarding the clarion call for pro-environmental behaviour. Finally, the main consumer or the intended recipient [student] gets the information. The next part looks at administering questionnaires to be filled by hostel students.

Two major approaches are used; the first involved the distribution and filling of questionnaires and the second involved 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 the table below. The highest accommodated hostel has 400 students with the least accommodated having 115 students. This is shown in the table below.

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. However, this is a large number of the 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. However, the goal was also to a medium number of students, this helps in providing us with a comprehensive analysis. 500 students were selected to answer the questionnaires which were evenly distributed among the hostels. This is where we employ stratified random sampling since the population is divided into the number of occupants in a room. The next part looks at the number of people to select from each hostel. The sample size for each hostel is computed using: *sample size of hostel =*

$\frac{SP}{N} \times n$. Also the hostels have room allocations given 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. The table below illustrates:

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	

Characteristics	Frequency	Percent (%)
-----------------	-----------	-------------

MBMB Hostel	400	119	5	17	20	
Edina Hostel	220	65	1	12	10	

4. RESULTS AND ANALYSIS

DEMOGRAPHIC ANALYSIS OF DATA

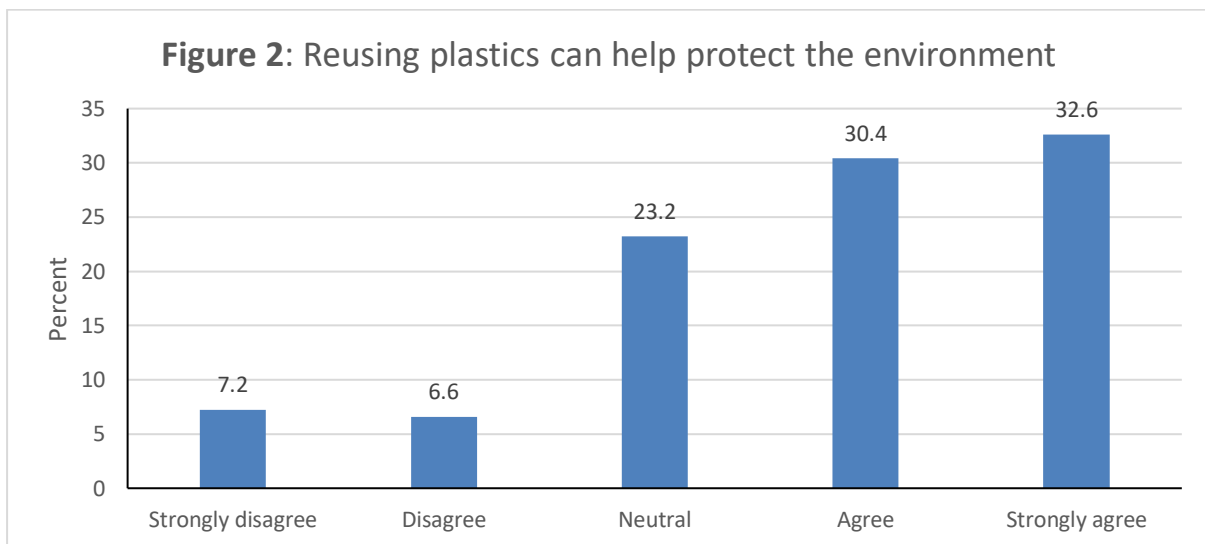
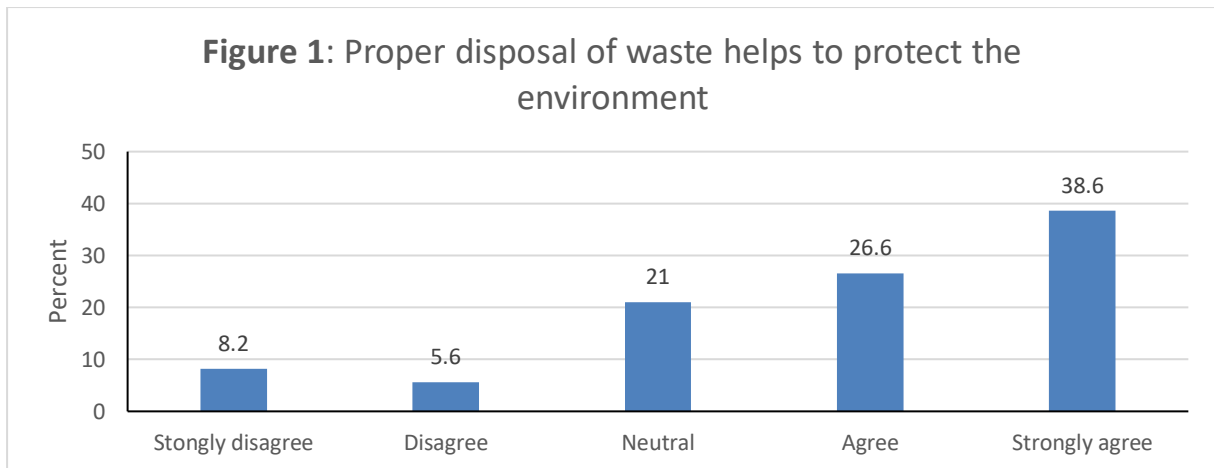
The statistical analysis starts with the demographic analysis of the data obtained. This is followed by an evaluation on students about common environmental practices. The purpose of this technique is to determine whether students were well informed about pro-environmental behaviour. Finally, a chi-square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

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 the table, it can be seen that out of the data collected, 264 were Males and 236 females which represent 52.8% and 47.2% respectively. This shows that the difference between both genders was small, 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. Majority of the students in these rooms were first year students as was the requirement of the university. Subsequently, the private owned hostels mostly provided accommodation for 1 and 2 in a room with few numbers of 4 in a room. Mostly level 200 to 400 students occupied these rooms.

EVALUATING STUDENT'S KNOWLEDGE ON ENVIRONMENTAL PROTECTION PRACTICES

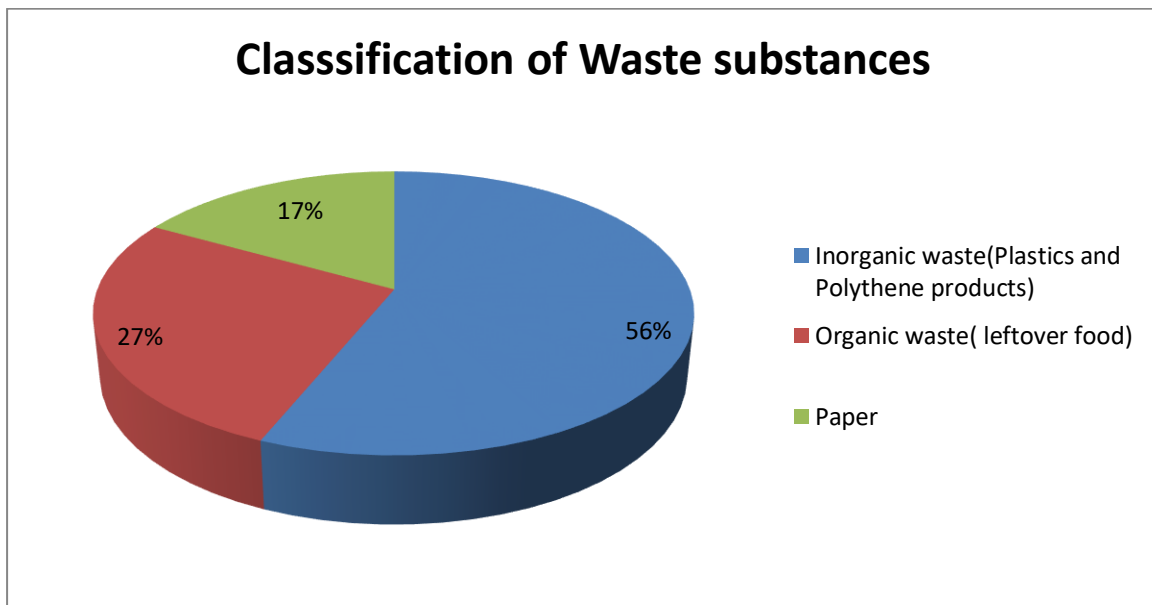
Students in both the traditional and private owned hostels were asked a plethora of questions on some common environmental protection practices to determine how much information they have had on some key solutions in protecting the environment. The questions ranged from the contribution of waste disposal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



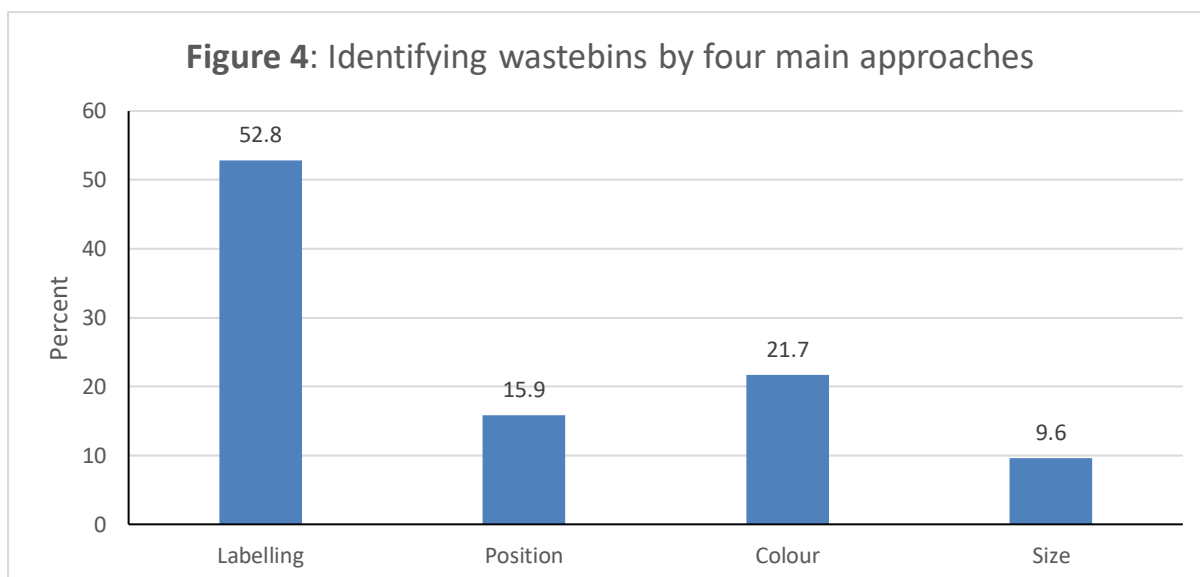
The first figure shows the responses of students with respect to the contribution of waste disposal in protecting the environment. There are five main categories of response which are: Strongly disagree, disagree, neutral, agree and strongly agree. This gave students a wide range of options from which 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 skeptical 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 next diagram 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 time and adequate access to good information on pro-environmental behaviour, students can make well-informed choices on being pro-environmental.



Due to the comprehensive effort by the institution to share information to students, most of the students there were able to realize that there are many classifications of waste and in addition, the type of waste substances they produced in large volumes. They are namely: Inorganic waste, Organic waste and Paper. Inorganic waste comprises mostly of plastic containers and polythene products, organic waste where the focus was mainly on leftover or spoiled food substances and paper. Out of these three main categories, Inorganic waste recorded the highest percentage of 56%, followed by organic waste with 27% and 17% for paper. Therefore, in the provision of dustbins, it is ideal to provide at least two bins to most room. This is because almost every room already had a dustbin; this then gives us three bins for waste disposal. Also with the provision of dustbins, it reduces the frequency of disposal of waste substances and eases the unpleasant stench of the waste products. The next approach is determining the best approach to employ in identifying the waste bins by the hostel students.

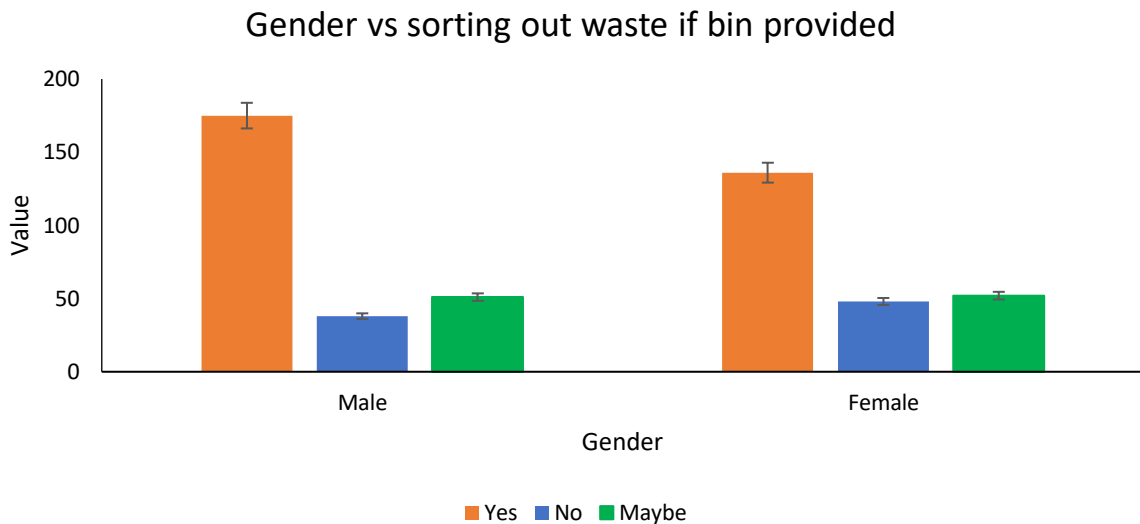


The identification of the bins is a vital part of sorting out waste and its disposal. Students are mostly reluctant in checking for the specific bins for disposal if it's not well identified. Four main divisions were considered: Labelling of bins, Positioning/placement of bins at vantage points, the colour of bin 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 colour 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 bins assigned to organic waste and then paper which is the least produced waste and which, in most cases can be compressed, is given 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.

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.

CHI-SQUARE ANALYSIS OF GENDER VS SORTING OUT OF WASTE



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 than females and this gave males the numerical advantage. Also, the factor of high attitude levels was not considered in this article.

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.

H₁: 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 (**H₀**). 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.

TESTING FOR THE STRENGTH OF ASSOCIATION

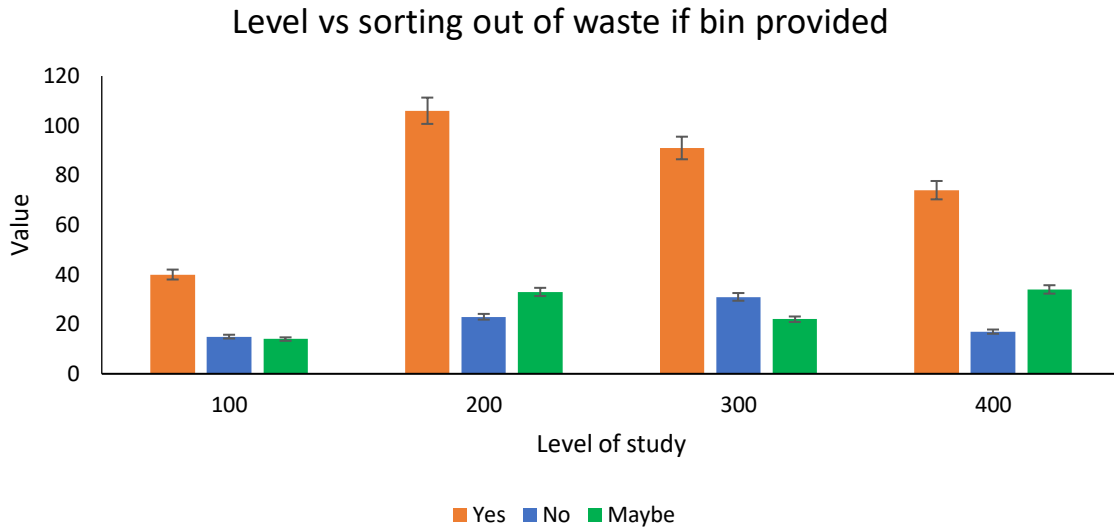
Symmetric Measures

		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.

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

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



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.

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.

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

H₁: 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 **H₀** 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.

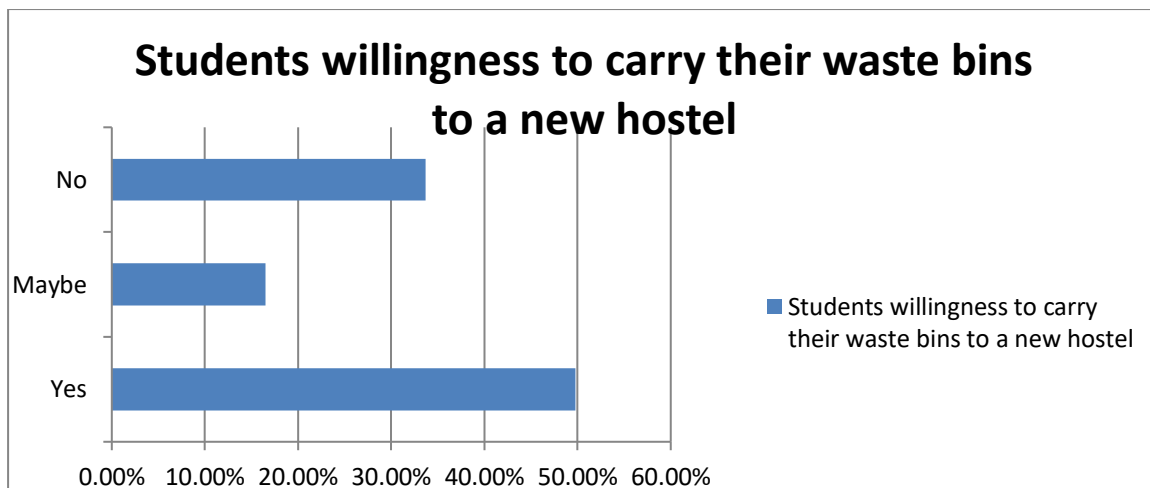
Symmetric Measures

		Value	Approximate Significance
Nominal by	Phi	.138	.148
Nominal	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.

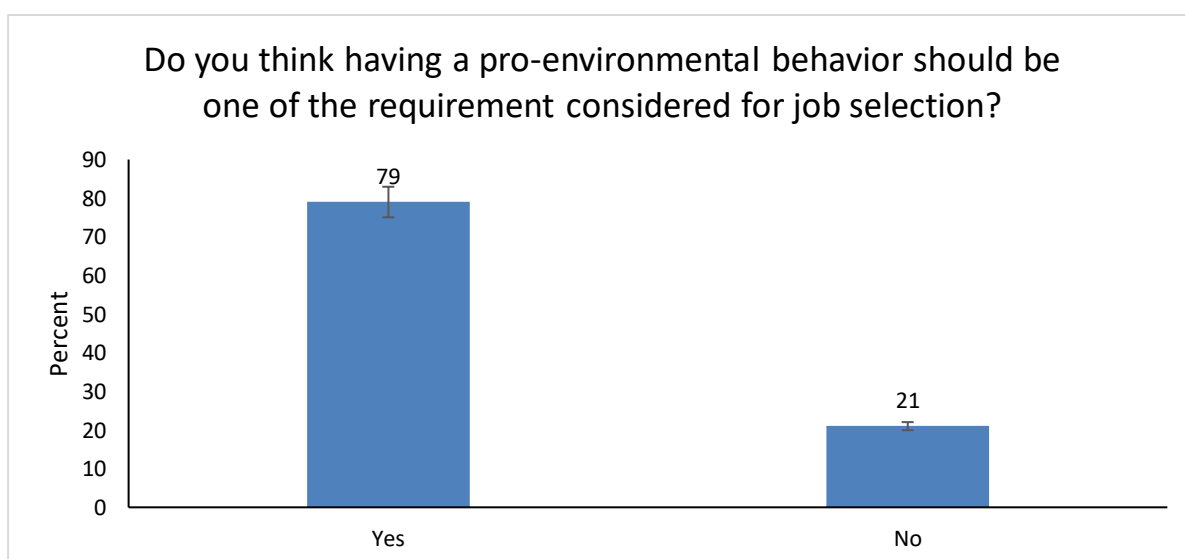
The Impact of Information sharing (internet) on pro-environmental behaviour

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 brood of the students preferred checking their student emails for information. Recently, the use of billboards has been one catchy 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.



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 effect of an adequate use of information sharing to reach out to the students. It is proposed that in the likelihood that a student decide to move to another hostel, if 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 most likely not 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.

It was realized that it yielded a positive response with 49.8% (250 students) selecting yes, 83 students representing 16.5% selecting maybe and 169 students (33.7%) selecting the no option. Although the number of students who answered positively formed the majority, a large number also selected No and maybe. I believe information sharing within the population must be intensified to be able to obtain a higher value.



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 losses 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 long age problem of environmental pollution.

5. DISCUSSIONS

The current investigation continues an exhaustive studies 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.

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 behavior. As with any experiment, the current investigation was conducted assessing the behavior of students in embracing environmentally friendly lifestyle with no presumption of access to a priori 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 behavior. 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 behavior. 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 behavior. Hence, in the not-too-distant future we hope to carry out similar investigation on a much humongous scale, by which time majority of students will presumably be well informed and better poised to adopt a pro-environmental lifestyle.

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.

References

- Allcot, H. (2011). Social norms and energy conservation. *J. Public Econ.*, *95*, 1082-1095. doi:<https://doi.org/10.1016/j.jpubeco.2011.03.003>.
- Bohner, G., & Schlüte, L. (2014). A room with a viewpoint revisited: Descriptive norms and hotel guests' towel reuse behavior. *Plos One*, *9*(8). doi:<https://doi.org/>
- Casaló, L., & Escario, J. (2018). Heterogeneity in the association between environmental attitudes and pro-environmental behavior: a multilevel regression approach. *J. Clean. Prod.*, *75*, 155-163. doi:<https://doi.org/10.1016/j.jclepro.2017.11.237>
- Costa, D., & Kahn, M. (2013). Energy conservation “nudges” and. *J. Eur. Econ. Assoc.*, *11*(3), 680-702. doi:<https://doi.org/10.1111/jeea.12011>
- Dornhoff, M., Sothmann, J., Fiebelkorn, F., & Menzel, S. (2019). Nature relatedness and environmental concern of young people in Ecuador and Germany. *Front. Psychol.*, *10*, p.453. doi:10.3389/fpsyg.2019.00453
- Ferraro, P., & Price, M. (2013). Using non-pecuniary strategies to influence behavior: Evidence from a large-scale field experiment. *Rev. Econ. Stat.*, *95*(1), 64-73. doi:<https://doi.org/10.1002/zaac.201300505>
- Heimlich, J., & Ardoin, N. (2008). Understanding behavior to understand behavior change: A literature review. *Environ. Educ. Res.*, *14*, 215-237. doi:10.1080/13504620802148881

- Lee, Y., Kim, S., Kim, M., & Choi, J. (2014). Antecedents and interrelationships of three types of pro-environmental behavior. *J. Bus. Res.*, *67*(10). doi:<https://doi.org/10.1016/j.jbusres.2014.04.018>
- Li, D., Zhaoc, L., Mab, S., Shaoe, S., & Zhang, L. (2010). What influences an individual's pro-environmental behavior? A literature review. *Resour. Conserv. Recycl.*, *146*, 28-34. doi:<https://doi.org/10.1016/j.dsr.2018.12.003>
- Lozano, R., Lukman, R., Lozano, F., Huisingh, D., & Lambrech, W. (2013). Declarations for sustainability in higher education: becoming better leaders through addressing the university system. *J. Clean. Prod.*, *48*, 10-19.
- Spence, A., & Pidgeon, N. (2010). Psychology, climate change & sustainable behavior. *Environment*, *51*, 8-18.
- Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: an integrative review and research agenda. *J. Environ. Psychol.*, *29*, 3093-17.
- Stern, P. (2000). New environmental theories: toward a coherent theory of environmentally significant behavior. *J. Soc. Issues*, *56*(3), 407-424.
- Thu, V., Tran, D., Goto, D., & Kawata, K. (2020). Does experience sharing affect farmers' pro-environmental behavior? A randomized controlled trial in Vietnam. *World Dev.*, *136*, 1-14. doi:<https://doi.org/10.1016/j.worlddev.2020.105062>
- Zilahy, G., & Huisingh, D. (2009). The roles of academia in regional sustainability initiatives. *J. Clean. Prod.*, *17* (2), 1057-1066.
- Agbefe, L. E., Lawson, E. T., & Yirenya-Tawiah, D. (2019). Awareness on waste segregation at source and willingness to pay for collection service in selected markets in Ga West Municipality, Accra, Ghana. *Journal of Material Cycles and Waste Management*, *21*, 905-1914.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179-211. <https://doi.org/10.1080/10410236.2018.1493416>
- Banga, M. (2013). Household Knowledge , Attitudes and Practices in Solid Waste Segregation and Recycling : The Case of Urban Kampala Recycling : The Case of Urban Kampala. *Zambia Social Science Journal*, *2*(1), 27-39.
- Chakraborty, A., Singh, M. P., & Roy, M. (2017). A study of goal frames shaping pro-environmental behaviour in university students. *International Journal of Sustainability in Higher Education*, *18*(7), 1291-1310. <https://doi.org/10.1108/IJSHE-10-2016-0185>
- Economist Impact, & The Nippon Foundation. (2021). *THE STRUGGLE FOR CIRCULARITY : GHANA EMBRACES ITS PLASTIC WASTE*.
- Hansmann, R., Laurenti, R., Mehdi, T., & Binder, C. R. (2020). Determinants of pro-environmental behavior: A comparison of university students and staff from diverse faculties at a Swiss University. *Journal of Cleaner Production*, *268*, 121864. <https://doi.org/10.1016/j.jclepro.2020.121864>
- Kollmuss, A., & Agyeman, J. (2002). Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, *8*(3), 239-260. <https://doi.org/10.1080/13504620220145401>
- Nik Mat, N. H., Mohamed, M., Fawehinmi, O., Yusliza, M.-Y., & Saputra, J. (2020). Investigating the Antecedents of Students` ProEnvironmental Behaviour in the Malaysian Public University. *Talent Development & Excellence*, *12*(3), 1953-1969.

<http://search.ebscohost.com/login.aspx?direct=true&db=s3h&AN=144289687&lang=ja&site=ehost-live>

- Onokala, U., Banwo, A. O., & Okeowo, F. O. (2018). Predictors of Pro-Environmental Behavior: A Comparison of University Students in the United States and China. *Journal of Management and Sustainability*, 8(1), 127. <https://doi.org/10.5539/jms.v8n1p127>
- Owusu, G. (2010). Social effects of poor sanitation and waste management on poor urban communities : a neighborhood-specific study of Sabon Zongo , Accra This article was downloaded by : [Owusu , George] *Journal of Urbanism : International Research on Placemaking and U. Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 3(August), 145–160. <https://doi.org/10.1080/17549175.2010.502001>
- Pichert, D., & Katsikopoulos, K. V. (2008). Green defaults: Information presentation and pro-environmental behaviour. *Journal of Environmental Psychology*, 28(1), 63–73. <https://doi.org/10.1016/j.jenvp.2007.09.004>
- Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, 29(3), 309–317. <https://doi.org/10.1016/j.jenvp.2008.10.004>
- Tezel, E., Ugural, M., & Giritli, H. (2018). Pro-environmental Behavior of University Students: Influence of Cultural Differences. *European Journal of Sustainable Development*, 7(4), 43–52. <https://doi.org/10.14207/ejsd.2018.v7n4p43>
- Tonglet, M., Phillips, P. S., & Bates, M. P. (2004). Determining the drivers for householder pro-environmental behaviour: Waste minimisation compared to recycling. *Resources, Conservation and Recycling*, 42(1), 27–48. <https://doi.org/10.1016/j.resconrec.2004.02.001>
- Vicente-Molina, M. A., Fernández-Sáinz, A., & Izagirre-Olaizola, J. (2013). Environmental knowledge and other variables affecting pro-environmental behaviour: Comparison of university students from emerging and advanced countries. *Journal of Cleaner Production*, 61, 130–138. <https://doi.org/10.1016/j.jclepro.2013.05.015>
- Yusliza, M. Y., Amirudin, A., Rahadi, R. A., Athirah, N. A. N. S., Ramayah, T., Muhammad, Z., Dal Mas, F., Massaro, M., Saputra, J., & Mokhlis, S. (2020). An investigation of pro-environmental behaviour and sustainable development in Malaysia. *Sustainability (Switzerland)*, 12(17), 1–21. <https://doi.org/10.3390/su12177083>
- Xiao, Y., Liu, X., & Ren, T. (2022). Internet use and pro-environmental behavior: Evidence from China. *PloS one*, 17(1), e0262644.
- Vicente-Molina, M. A., Fernández-Sainz, A., & Izagirre-Olaizola, J. (2018). Does gender make a difference in pro-environmental behavior? The case of the Basque Country University students. *Journal of Cleaner Production*, 176, 89-98.