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STUDENTS' WASTE MANAGEMENT PRACTICES: ASSOCIATION TO DEMOGRAPHIC PROFILE

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Abstract: Many studies revealed that the individual's demographic profile may serve to foster his position on environmentalism. While these variables helped to explain the similarities or differences in environmental support, nonetheless, the demographics were not proven to have constant association to the individual's environmental practices. Such observations motivated the researcher to examine the association of the college students' demographic profile (gender, course, year level, and academic grade) and waste management practices (reduce, reuse, and recycle practices or 3Rs).
Findings of this study revealed the following: (1) that on the average, the sample college students displayed less than fifty percent of the time (*sometimes*) practicing each of the 3Rs waste management practices; (2) that the students' reduce practices are dependent on their course, year level, and academic grade; (3) that the students' reuse practices are dependent on their course and year level; and (4) that the students' recycle practices are consistently not dependent on any of the profile variables.
Since no demographics obtained consistent association to practices, the researcher strongly suggests that the reduce, reuse, and recycle practices at all times, regardless of profile, should be given equal attention in the care for the environment. Results of this study may promote pro-environmental behavior to each student not to buy or collect items that are not deem necessary, or items that come in wasteful packaging, or items that cannot be recycled. Students may set as examples for other people to follow and could make positive contributions in caring the environment.
Keywords: waste management practices, reduce, reuse, and recycle.

1. Introduction

Studies show that unmanaged waste disposal is considered the main cause of environmental problems. Due to the rapid growth in population and consequently raise the consumption of packed goods, the amount of non-biodegradable waste is increasing over time. Within the areas of the household and school, an individual or a student in particular, is one of the waste generators. The physical condition of home and school are reflections of how the students think about the environment. By being committed to and conscious of their impact on the

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environment, students may set as examples for other people to follow and could make positive contributions in caring the environment.

Several studies on waste management have focused and investigated people's environmental practices. A number of variables on demographic profile of representative samples received consistent attention among researchers. These variables were examined as to existence of difference, association and correlation to individuals' waste management practices. Based on previous researches, there were several compelling reasons to expect that demographic profile may serve to foster individuals' position on environmentalism.

Researches done in several countries attempted to identify the demographic variables that influence individuals to participate in waste management activities, but consistency has not been established in terms of association of the said variables. Some studies disclosed that individuals' waste management practices were associated to a number of demographic variables while others were not. Since previous researches indicated that no variables showed consistent association of individuals' profile and participation to environmental care, the researcher was motivated to examine such in this study.

2. Methodology

A survey instrument eliciting information about the demographic profile (gender, course, year level, and academic grade) and waste management practices (reduce, reuse, and recycle practices or 3Rs) were administered to a sample of three hundred (300) college students taking courses in the fields of health, science, and technology at the Pamantasan ng Lungsod ng Maynila (PLM) in 2012. PLM is a chartered university created by the Congress of the Philippines in 1965, now with twelve (12) colleges, two (2) professional schools, and seven (7) graduate schools.

Ten items of each of the 3Rs practices were included and intentionally arranged in different orders in the survey instrument so as not to distinguish that the item being asked from the respondent is about the reduce, reuse, or recycle practices. The questionnaire is customized to student-respondents in such a way that only items related to students' environmental activities were asked. The respondents were asked to describe their waste management practices indicated in the thirty-item survey instrument by rating themselves according to the frequency on how they practiced them, categorized as: *always* (100% of the time, code 4), *often* (more than 50% of the time, code 3), *sometimes* (less than 50% of the time, code 2), and *never* (0% of the time, code 1).

3. Results and Discussion

3.1. Students' Gender and Environmental Practices

Table 1 shows that both genders have almost the same level of waste management practices except in the reuse practice where female students (2.55) tend to reuse materials more often than male students (2.41). Considering the overall practice, though both gender fall on the same category, still figures revealed that women (2.45) are more likely to be pro-environmental than men (2.37).

Table 1. Waste Management Practices by Gender

Gender	n	Reduce		Reuse		Recycle		Overall	
		Mean	Desc.	Mean	Desc.	Mean	Desc.	Mean	Desc.
Female	184	2.46	S	2.55	O	2.33	S	2.45	S
Male	116	2.50	S	2.41	S	2.21	S	2.37	S
Total	300	2.48	S	2.49	S	2.28	S	2.42	S

Legend: Desc.-description; O-often; S-sometimes

This supports the results of the study of Tikka, Kuitunen and Tynys (2000), where major variations among students were found according to their gender. Female students tend to show more responsibility toward the environment than male students based on their research. Likewise, Yilmaz, Boone and Andersen (2004) identified the intensity of students' views with regard to environmental issues and revealed in their study that female students exhibited more support for environmental issues than male students.

Different results were obtained by Eisler, Eisler and Yoshida (2003) when they explored the gender differences on environmental beliefs, opinions, knowledge and behavior. Their findings showed that male have higher environmental knowledge, however, female were more aware of the environmental risk. Similarly, Shen and Saijo (2007) in re-examining the relations between socio demographic characteristics and individual environmental concern found out that male were more concerned about environment than female. According to them, this may be attributed to being more altruistic, more politically active and having higher levels of education of men than women.

Contrary to these, when Alp, Ertepinar and Tekkaya (2006) conducted an investigation concerning children's environmental knowledge and attitudes, their study showed that gender difference on environmental knowledge was not statistically significant;

however, the effect of gender attitudes toward the environment, according to them, was statistically significant in favor of female.

Table 2. Association of Waste Management Practices and Gender

Practices	Chi-Square	P-Value*	Conclusion
Reduce	5.9338	0.0515	not significant
Reuse	5.3679	0.0683	not significant
Recycle	0.4396	0.8027	not significant

** Significant at $p < 0.05$.*

To examine in this present study the association of the students' gender and waste management practices, the chi-square test was employed. Table 2 reveals that the p-values of reduce (0.0515), reuse (0.0683), and recycle (0.8027) imply that students' practices are not dependent on their gender.

3.2. Students' Course and Environmental Practices

Students in the three courses consistently displayed less than fifty percent of the time (*sometimes*) in recycling waste materials. However, students in the health related course, more often practice reducing (2.64) and reusing (2.62) materials than the students in the science (2.35 and 2.47, respectively) and technology courses (2.44 and 2.38, respectively) as posted in Table 3.

Table 3. Waste Management Practices by Course

Course	n	Reduce		Reuse		Recycle		Overall	
		Mean	Desc.	Mean	Desc.	Mean	Desc.	Mean	Desc.
Health	100	2.64	O	2.62	O	2.41	S	2.56	O
Science	100	2.35	S	2.47	S	2.23	S	2.35	S
Technology	100	2.44	S	2.38	S	2.21	S	2.35	S
Total	300	2.48	S	2.49	S	2.28	S	2.42	S

Legend: Desc.-description; O-often; S-sometimes

To have deeper understanding of the role of course in the individuals' environmental care, it is worth relating the results of this study to other researches. Of the different educational groups studied by Tikka, Kuitunen and Tynys (2000), students of biology exhibited the most

positive attitudes, displayed the greatest levels of knowledge and participated in many nature-related activities. However, some evidence in their research exposed that students enrolled in the courses related to technology and economics adopted a more negative attitude toward the environment and, on the average, had fewer nature-related hobbies than students in general. Likewise, in the investigation of undergraduate students' environmental attitudes (Kose et al., 2011), results revealed that medicine faculty students expressed more positive environmental attitudes than both engineering and economic and administrative sciences faculty students. In addition, economic and administrative sciences faculty students displayed more positive environmental attitudes than engineering faculty students.

When Hsu (2004) assessed the effects of an environmental education course on college students' responsible environmental behavior and associated environmental literacy variables, he showed that course significantly promoted the students' responsible environmental behavior, locus of control, environmental responsibility, intention to act, perceived knowledge of environmental issues, and perceived knowledge of and skills in using environmental action strategies. The findings of Coertjens, Pauw, Maeyer and Petegem (2010) supported these observations when they revealed that educational track is one of the important factors in explaining students' environmental attitudes and awareness. Their study showed that schools in which science is taught in a more hands-on manner are associated with higher student environmental awareness. Also, Yilmaz, Boone and Andersen (2004) exposed that high achievement in science courses resulted in more positive attitudes toward environmental issues.

On the other hand, Erdogan (2013) disclosed in his study that taking a course on environment makes only slight difference in opinions. He further concluded that students' environmental orientations change in varying extent due to other demographic variables which are probably determined by the historical and cultural context and the characteristics of the population under study.

Table 4. Association of Waste Management Practices and Course

Practices	Chi-Square	P-Value*	Conclusion
Reduce	16.9483	0.0020	significant
Reuse	15.4619	0.0038	significant
Recycle	4.3821	0.3568	not significant

** Significant at $p < 0.05$.*

Table 4 reveals after examining the association of the students' course and waste management practices using the chi-square test that the p-values of reduce (0.0020) and reuse (0.0038) signify dependency of students' practices to their course. On the contrary, the p-value of recycle (0.3568) indicates that students' practices are not associated with their course.

3.3. Students' Year Level and Environmental Practices

The students in the higher year (third and fourth year) more often demonstrate reduce (2.55) and reuse (2.58) practices than the lower year (first and second year) students (2.41 and 2.42, respectively). In recycling, however, all the samples belong to the same category sometimes (less than fifty percent of the time) in terms of this practice (Table 5).

Table 5. Waste Management Practices by Year Level

Year Level	n	Reduce		Reuse		Recycle		Overall	
		Mean	Desc.	Mean	Desc.	Mean	Desc.	Mean	Desc.
Higher	136	2.55	O	2.58	O	2.35	S	2.50	O
Lower	164	2.41	S	2.42	S	2.22	S	2.35	S
Total	300	2.48	S	2.49	S	2.28	S	2.42	S

Legend: Desc.-description; O-often; S-sometimes

Findings of this study are similar to the results of the study of Ozden (2008) when he examined the effect of year level on the attitudes of participants toward environmental problems. He concluded that fourth year student-teachers have more positive attitudes towards environmental issues than first year student-teachers. Likewise, Alp, Ertepinar and Tekkaya (2006) found in their study that the students having higher grade level also have higher levels of environmental knowledge. In fact, in their study, a grade level was found to be a determinant of environmental knowledge as well as environmental friendly behaviors.

Contrary to these, in a study that explored the nature of college students' environmental worldviews and test hypothesized relations on environmental views and school status, Erdogan (2013) found out that first year students have higher pro-environmental orientations than other year levels. Similarly, when the relationship between education level and environmentalism where explored by Puglia (2011), he obtained a negative relationship.

On the other hand, in studying the environmental attitudes and behaviors of college students, Heyl, Díaz and Cifuentes (2013) disclosed that **w**ith regard to the level or year of

the career, no significant differences in environmental attitudes and behavior were found. Such results are similar to the research conducted by Eryigit (2010) where no statistically significant grade level effect was found across grade levels with respect to students' environmental attitudes.

Table 6. Association of Waste Management Practices and Year Level

Practices	Chi-Square	P-Value*	Conclusion
Reduce	9.1929	0.0101	significant
Reuse	8.0829	0.0176	significant
Recycle	3.0827	0.2141	not significant

* *Significant at $p < 0.05$.*

After testing the association of the students' year level and waste management practices using the chi-square test, Table 6 disclosed that the p-values of reduce (0.0101) and reuse (0.0176) denote association of students' practices with their year level. On the contrary, the p-value of recycle (0.2141) shows that students' practices are not dependent on their year level. It may be recalled that the same findings were revealed earlier when students' practices were associated with their course.

3.4. Students' Academic Grades and Environmental Practices

Students with academic grades better than 2.00 consistently displayed higher level of waste management practices compared to the other group. However, considering the overall practice of the three hundred students, the representative sample clustered according to academic grade fall under the same category sometimes (Table 7).

Table 7. Waste Management Practices by Academic Grade

Academic Grade	n	Reduce		Reuse		Recycle		Overall	
		Mean	Desc.	Mean	Desc.	Mean	Desc.	Mean	Desc.
1.00-2.00	171	2.45	S	2.59	O	2.33	S	2.46	S
2.01-3.00	129	2.31	S	2.53	O	2.27	S	2.37	S
Total	300	2.48	S	2.49	S	2.28	S	2.42	S

Legend: Desc.-description; O-often; S-sometimes

This may be related to the study of Gokce, Kaya, Aktay and Ozden (2007) when they examined the elementary students' attitudes towards the environmental issues. Their study

revealed that the students' academic success levels prove significant difference on their attitudes towards the environmental issues.

On the contrary, when difference in students' environmental attitudes and awareness were studied by Coertjens (2010), no significant difference were found between more science-literate students and the less or average science-literate students in terms of environmental awareness. Similar to this, Rideout (2014) investigated whether class status and the college's core curriculum as well as other experiential variables were associated with a change in students' environmental awareness. His findings disclosed that class status showed no reliable influence on students' environmental awareness.

Table 8. Association of Waste Management Practices and Academic Grade

Practices	Chi-Square	P-Value*	Conclusion
Reduce	7.2983	0.0260	significant
Reuse	0.7071	0.7022	not significant
Recycle	0.5522	0.7587	not significant

** Significant at $p < 0.05$.*

Examining the association of the students' academic grade and waste management practices in Table 8 using the chi-square test resulted to p-values of reduce (0.0260) which signifies dependency of students' practices to their academic grade. On the other hand, the p-values of reuse (0.7022) and recycle (0.7587) imply that students' practices are not associated with their academic grade.

4. Conclusion and Recommendation

Based on the statistical results presented in this study, the following conclusions are drawn: (1) that on the average, the sample college students displayed less than fifty percent of the time (*sometimes*) practicing each of the 3Rs waste management practices; (2) that the students' reduce practices are dependent on their course, year level, and academic grade; (3) that the students' reuse practices are dependent on their course and year level; and (4) that the students' recycle practices are consistently not dependent on any of the profile variables.

Since no demographics obtained consistent association to practices, the researcher strongly suggests that the reduce, reuse, and recycle practices at all times, regardless of profile, should be given equal attention in the care for the environment. Results of this study may promote pro-environmental behavior to each student not to buy or collect items that are not deem

necessary, or items that come in wasteful packaging, or items that cannot be recycled. Students may set as examples for other people to follow and could make positive contributions in caring the environment.

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