Environmental Education at Federal University of Maranhao: A Research Carried Out in the Courses of Business Administration, Accounting and Biology in the São Luis Campus

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Abstract

This articles aims at investigating the environmentally-oriented behavior of students of the Business Administration, Accounting and Biology Courses of the Federal University of Maranhão, which aspirates to contribute for future methodological approaches on environmental consciousness. The sample size was 296 Students. Such study showed that the scholars addressed proved to have limited knowledge concerning the various aspects related to environmental care. Was observed that albeit 68,4% of the responders of the research have always evidenced interest in the environment issue, 61,5% of them do not attend related lectures or participated in activities on environmental preservation within 2009, 2010 and 2011. It was observed that 83,1% of the students enrolled in the Accounting and 39,2% in Administration affirmed that never attended a discipline that address environmental issues in their courses. Facing the results of the research, the incorporation of a more efficient process of Environmental Education in the university curriculum is necessary.

Keywords: Environment Education, Environmental Preservation, Environmentally-oriented Behavior, Higher Education, Federal University of Maranhao

1. Introduction

Recently, environment is considered one of the most significant concerns of society. Climate change, distinct forms of pollution, extinction of species as well as deforestation are issues broadly debated inside and outside of the academic realm. The university which is engaged with social causes and is also responsible for the process of knowledge-building as well as for the creation of values must include the environment factor to various academic levels (teaching, research and extension courses). Institutions of Higher Education (IHE) play an important role when it comes to the insertion of the environment issue in the academic sphere, as pointed out by Marconim e Silva (2010), Morales (2009), Guimarães et al. (2009), Tristão (2007), Sato (2003) among others.

Environmental Education (EE) is an example of what was established in the Conference of Tbilisi, 1997, and according to Sato (2003) and Nunes (1988), it is a constant process of value-building, knowledge development and concept clarification, which aims to foster the improvement of abilities and attitudes that qualify people towards the process of decision-making and morality. Based on the premises established by the Tbilisi Conference as well as on conception of the Loureiro (2004), Sato (2003) and Nunes (1988), it is worth pointing out a few EE principles, which would promote the development of EE programs in universities such as the consideration of environmental, social, economic, political, ethical, aesthetics, philosophical, historical, cultural, moral, among others; the incorporation of scientific knowledge and the collective participation in search of solutions; insist in effective participation of each individual as to avoid and address problems, developing the critical thinking as well as the abilities required for plainly citizenship.

Currently, Environmental Education is a widely discussed subject, as well as the approaches to it. Ferraz (2004) emphases that few people are indeed compromised with the change of values. Thus, in order to foster process of EE that comprise such changes, it is necessary to verify the perception that individuals have with regards to environmental questions (SATO, 2003).

The environmental perception can be applied based on Merleau-Ponty (1994); Corleto (1998) e Silva *et al* (2012), as a means to assess the values attributed to a place and to assist the environmental planning as well as to favor the development of sustainable societies. Moreover, according to Hammes (2004), the environmental perception of an individual or of a community is directly related to the way such individuals interact with the environment.
According to Sato (2003) perception, it is important to identify the environmental perception that individuals maintain the first initiative for the education of people able to act critically and thus transform reality.

Within this context, environmental education is regarded as a key element for the transformation of the student's consciousness. Thus, the articles promotes an investigation on the environmental behavior of scholars in higher education courses such as Administration, Accounting and Biology in the Federal University of Maranhao (FUM), identifying mandatory aspects for the construction of a methodological approach towards environmental consciousness.

2. Literature Review

2.1 Environmental Education

According to Demo (1996), education is not restricted to teaching, instruction and training. It is above all, the promotion of autonomy of a competent individual as the educator is not the focus of teaching, but the process-maker and work partner, which comprises individuality and solidarity. In a broader sense, education is a process of acting embedded in a community regarding the development of the individual so as it can act in a society mature enough to seek the acceptability of collective objectives.

The learning process must consider men regarding its physical and intellectual, conscious of the possibilities and limitation, and capable of comprehending and reflecting on the surrounding world. Especially from the seventies onwards, with the perception and diffusion that natural resources are limited, admit the environmental crises and the discussions concerned with the future of the planet, which culminate in world scale conferences on environmental issues. The learning process must consider men regarding its physical and intellectual, conscious of the possibilities and limitation, and capable of comprehending and reflecting on the surrounding world. Especially from the seventies onwards, with the perception and diffusion that natural resources are limited, we admit the environmental crises, flourishing discussions concerned with the future of the planet, which culminate in world scale conferences on environmental issues.

According to Sato (2003), the principal definition for Environmental Education was adopted in 1971 by the International Union for the Conservation of Nature. The Stockholm Conference widened its definition comprising other areas of study, and the Tbilisi Conference defined the concept of Environmental Education as a process of recognizing values and elucidation of concepts, seeking at developing abilities and modifying attitudes in relation to the surroundings, which may contribute to the comprehension of relations between men, culture and the biophysical means (SATO, 2003).

In Brazil, the concern with environmental quality has manifested in 1981 with Federal Law #6.938, which establishes the National Policy for the Environment, followed by the Federal Constitution of 1987, which assures health environment for all, as well as the Environmental Education Agreement of the Ministry of Education (MEC, 2012).

However, was Federal Law #9.795/99 (National Policy for the Environmental Education -- PNEA), that implemented the Environmental Education to all levels and age groups (SATO, 2003). Based on PNEA, the National Program for Environmental Education (ProNEA), besides promoting educational actions towards social-environmental improvement, protection and recovery, it also aims to promote education as a means for cultural and social changes.

Considering the principles embedded in PNEA, and ProNEA, the Headquarters for Environmental Education of the Ministry of Environment (DEA/MMA) created the National Program for the Environmental Educators (ProFEA), whose purpose is to qualify federal public policies on environmental education by means of *Coletivos Educadores (*Collective Educators) *(*Ministry of Environment, 2005). The Collective Educator is a group of people who contribute with the support of their respective institutions to the process of education in a specific territory. It is a newly-created proposal that is considered strategic in the implementation of public policies either in the federal, state or municipal level, and is current under implementation. In compliance with this, networks of Environmental Education (REBECA, CEAs among others) is of fundamental importance for the establishment of public policies and the promotion of actions related to environmental education.

The evidence that a concept of fundamental significance as environment does not integrate the social dimension to the ecological counterpart reveals that harsh and dedicated process through which environment education is going. Its effectiveness requires conceptualization which hereafter is able to promote consciousness and thus new behavior facing nature (BRUGGER, 1994). The introduction of a conceptual reference within the process of environmental education is necessary as the basis for the insertion of the individual; following the recognition of the environment his is located. Barbiere and Silva (2011) point out the objectives of the environment education with respect to the Belgrade Letter that follow:

- Consciousness: assist individuals and groups to gain consciousness and sensitivity towards environment as a whole and its respective problems;

- Knowledge: promote a basic comprehension on the environment, especially regarding the influences of the human and its respective activities;
- Attitude: propitiate value incorporation and motivation to lead to active participation to the protection of the environment, tackling its respective problems;
- Abilities: propitiate conditions so as individuals and groups develop abilities needed for such active role.
- Assessment Ability: stimulate the evaluation of effective procedures taken with regards to the environment and the programs of environmental education.
- Participation: contribute for the individuals and groups feel responsible and comprehend the urgency of environmental issues.

2.2. The Environmental Theme in the Graduation Courses at FUM

Barbieri (2004) comments that, in most higher education programs, environmental education is an activity that occurs merely due to the environment day celebrations or selective garbage collection, generated within the facilities of the institutions.

According to Tauchen and Brandli (2006), developing ecological conscious in different levels and sectors of the world society inevitably involves the education realm as the Higher Education Institutions (IES). However, few practices that are observed in IES, are in charge of qualifying and improve the conscious of future citizens.

Higher education courses, such Business Administration and Biology provided at FUM, offer matters related to environmental issues. In Biology, two classes are offered, which are: Ecology I and Ecology II. However, there are two subjects related with education that also highlights the environmental issue in the course curriculum: History and Education Policy and Educational Psychology. The Business Administration Course offers subjects on Environmental Management. The Accounting course, however, does not provide any subject on environment.

3. Research Methodology

This paper is classified as a quantitative research. This method is defined by applying the quantification method either on the procedures of collecting information or on the respective treatment of them by means of statistical technique. With regards to procedures, this research is classified as a survey, which according to Creswell (2010), it provides a quantitative or scored description of trends, attitudes or opinions of a certain population through a study conducted on a sample of such population. This study comprised a population of 1136 students, all of them enrolled in the courses of Business Administration, Biology and Accounting in the year 2012. Primarily, the size of the sample is assessed for an infinite population, considering a confidence rate of 95% and a sampling error of 5%, which results in 400 elements. Considering that the size of the sample is above 10% of the population, this figure was corrected, obtaining a sample of 296 students, according to Malhotra (2001).

With regards to the means of data collecting, a questionnaire of 22 closed questions was applied. The questionnaire was structured in different blocks of questions. The title of the first block refers to the academic qualification and environment. The second block allows the assessment of the attitudes of the students towards the environment. The third block addresses the profile of the respondent and respective family. The questionnaires were emailed to the students randomly chosen and collection of data was carried out from September 06th to November 10th, 2012. Following the collection, the data was tabled and analyzed. The most significant findings and discussion are described in item 04.

4. Results and Discussion

This item presents the most important results followed by the analysis of the data obtained. In order to facilitate the verification, the data was tabled and graphics were adopted. For presenting the results, tables and graphics were elaborate in order to facilitate the comprehension. The data show and evidence the importance of elaborating policies in IFES that might contribute for future methodological approaches on dealing with environmental awareness.

4.1 Sample Percentage with Respect to the Population the Courses Assessed

Based on a simple random sample, the research revealed a more intense participation of the students enrolled in the Business Administration Course, which represents 43,9% of the responders, followed by Accounting, representing 36,2%, and Biology, reaching 19,9%.

Considering that it was a simple and random sample, it is possible to statistically infer it towards proportions and figure out the percentage rate of the population in relation to each course (considering 95% of confidence), due to the sample variance.

Results show that the percentage of the population do the business administration course varied from 38% to 50%; that is, from 432 years to 568 students. With regards to Accounting, the percentage of the population varied 30,5% to 41,5%, that is, from 347 to 471 students. The variance of the population for Biology was from 15,5% to 24,5%, which are from 176 to 278 students, approximately.
Analyzing the percentage intervals that refer to the population, it is there is a higher chance that the sample comprises a percentage of business administration students in relation to the accounting course.

4.2 Environmentally-Oriented Activities in FUM

Analyzing each course individually, it is noticeable that 39,2% of the Business Administration Course and 28% of the Biology students affirmed that few environmentally-oriented activities are carried out. Such reality does not correspond to the Biology scenario, where roughly 74,6% students affirmed that environmentally-oriented activities are carried out.

Taking the entire sample under analyzes, it noteworthy that 58% of the responders affirmed that they do not perform any activity related to environment, which can be observed in table 01.

The evidence of data show the necessity of increasing the number of activities related to the preservation of the environment, with special emphasis to Courses of Business Administration and Accounting.

Table 01: Environmentally-Oriented Activities

Answers	Business Administration	Biology	Accounting	Total	Total (%)
NO	79	15	77	171	57,8%
YES	51	44	30	125	42,2%
Total				296	100,%

4.3 Students Participation in Activities or Lectures Related to Environmental Preservation

Table 02 evidence the number of students that have already attended any lecture or activity related to environmental preservation. The study points out that solely 38,5% attended activities in years 2009, 2010 and 2011.

Table 02: Students Participation in Activities or Lectures Related to Environmental Preservation

Answers	Business Administration	Biology	Accounting	Total	Total (%)
NO	79	14	89	182	61,5%
YES	51	45	18	114	38,5%

4.4 Number of Students per Course that Attended One Discipline that Address Environmental Theme

Table 03 evidences that 45 students of the Biology and 79 students of Business Administration attended one discipline that addresses environmental theme.

Table 03: Number of Students per Course that Attended One Discipline that Address Environmental Theme

Answers	Business Administration	Biology	Accounting	Total	Total (%)
NO	79	14	89	182	61,5%
YES	51	45	18	114	38,5%

It is worth pointing out that 51 Business Administration students were not aware of any discipline on environmental management in the curriculum; that is, 39,2% of the students of business administration course do not know the content of the course curriculum.

In Accounting, 107 students, 83,1% of the students, are unaware of any discipline on environmental management, which is indeed real. This reveals that such students are aware of content of the course curriculum. When it comes

to Biology, only 23,7% of the responders are unaware of any environmentally-oriented discipline in the course curriculum.

4.5 Student's Interest on Issues Related to Environment

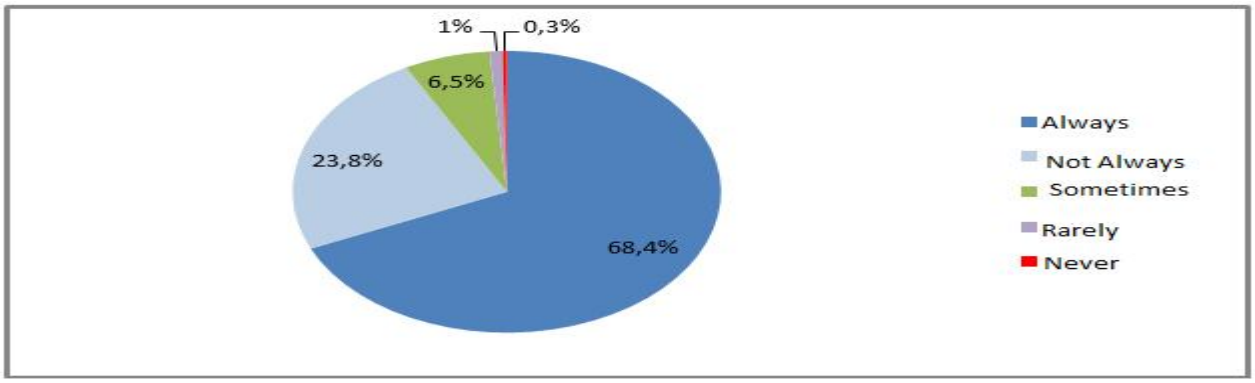
Throughout the research, the attitude of the students towards environmental subjects was also mapped. For such assessment, the identification of the student's interest on environmentally-oriented contents was previously identified, as shown in table 04.

Table 04: Student's Interest on Issues Related to Environmental

Answers	otal of Students	Total (%)
Always	201	68,4%
Not Always	70	23,8%
Sometimes	19	6,5%
Seldom	3	1,0%
Never	1	0,3%

It was found that the majority of the responders, 68,4%, showed interest in the subject. Only 1% of the students affirmed they rarely expressed interest in it. For ease of viewing these percentages are shown in figure 01.

Figure 01: Student's Interest on Issues Related to Environmental



However, the attitude and knowledge related to the environmental theme lacks more investment, as observed by analyzing the next results.

4.6 Awareness of the Responders towards the Garbage Selective Collection

With respect to the awareness of the students regarding the garbage selective collection, it was found that (based on number of students presented in table 05), 89,8% of the Biology students affirmed that they are thoroughly aware of the procedure.

Table 05: Awareness of the Responders towards the Garbage Selective Collection

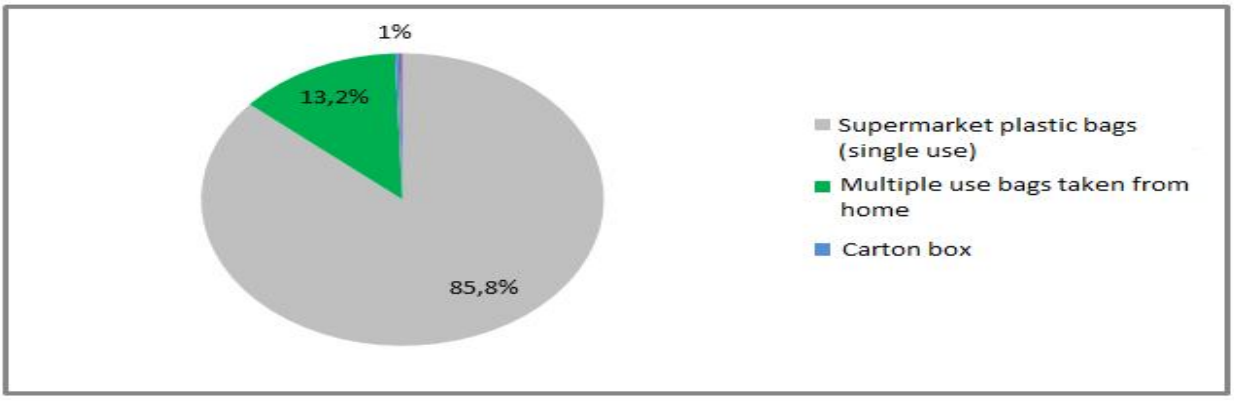
Answers	Business Administration	Biology	Accounting	Total	Total (%)
Yes, Well	84	53	64	201	67,9%
Yes, not so well	37	5	29	71	24,0%
Little	8	1	8	17	5,7%
Not at all	1	0	6	7	2,4%

In Business Administration, this percentage reaches 64,6%. In Accounting occurred the lowest percentage with 59,8%. This data evidenced that the most students enrolled in Business Administration and Accounting know how to proceed with garbage selective collection.

If considering a general evaluation, 97,6% of the students are aware of the garbage selective collection, but they believe that 67,9% of them are able to classify efficiently the waste based on a selective collection. It is noteworthy that of 59 students of Biology, solely one of them affirmed his precarious acquaintance towards selective garbage collection.

Such scenario does not surprising for this course is strongly associated with issues related to environmental preservation. It is observed in figure 02 that the most common material used to carry the supermarket shopping are plastic bags with preferred 85.8% of respondents.

Figure 02: Material Used to Transport Supermarket Purchases



The replacement of plastic bags in supermarkets by *ecobags* is a worldwide trend and is currently a widely discussed issue. In states such as São Paulo (SP), Rio de Janeiro (RJ), Minas Gerais (MG) and Rio Grande do Sul (RS) have state laws prohibit the use of plastic bags in supermarkets as well as provide some recommendations.

4.7 Forms of Battery Discard Adopted by the Responders

Relative to the battery discard after its useful life, it was found that the main mean of discard was the domestic garbage, which was adopted by 86,1% of the responders. It is emphasized that only 11,8% of the students take such waste to a proper recycling place as showed in the table 06.

This reveals that currently a considerable amount of batteries are discarded incorrectly regarding the preservation of the environment. It currently known that the domestic discard is not the most recommendable practice. Only 0,7% of the responders use garbage selective collection and solely 1,4% of the responders use other forms of discard.

Table 06: Forms of Battery Discard Adopted by the Responders

Answers	Business Administration	Biology	Accounting	Total	Total (%)
Domestic waste	112	49	94	255	86,1%
Taken to a proper recycling place	15	09	11	35	11,8%
House garbage selective collection for there is such sort of collection where a live	1	0	1	2	0,7%
Other forms of discard	2	1	1	4	1,4%

Observing other results, it is surprising that only two students live in places where has collection selective garbage, which corresponds to less than 1% of the sample. This is a worrying result, which evidences the need of public preventive initiatives regarding a more efficient management of residential waste.

Analyzing the courses individually, only 15,3% of the biology students discard batteries correctly. In the Business Administration Course, as well as Accounting, the percentage is even lower, corresponding respectively to 11,5% and 10,3%.

4.8 Student's age Group per Course

With regards to the group age of the responders, it was found that the majority correspond to 21 to 25 years-old students, figuring 66,2%. On the other hand, the age group comprising the lower percentage of students was from 36 to 40 years or above 40 years representing 0,7% and 0,3%, respectively, according to the table 07.

Such information confirms that indeed the majority of students of Business Administration, Accounting and Biology are young. Observe that 81,4% of them are 25 years old or less. Solely 1% the responders are 36 years old of age or more.

Table 07: Student's Age Group per Course

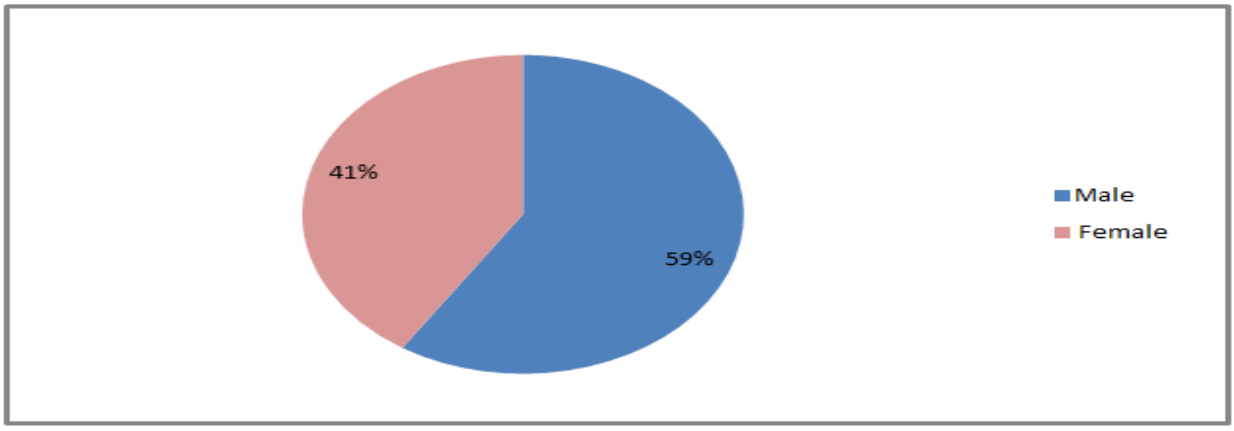
Answers	Business Administration	Biology	Accounting	Total	otal
Up to 20 years of age	23	13	9	45	15,2%
From 21 to 25 years of age	87	40	69	196	66,2%
From 26 to 30 years of age	16	6	24	46	15,6%
From 31 to 35 years of age	2	0	4	6	2,0%
From 36 to 40 years of age	2	0	0	2	0,7%
Above 40 years of age	0	0	1	1	0,3%

Looking at the age group of each course, it is observed that the course with the highest percentage of young students is biology, which comprises 90% of the students of 25 years of age or less. The age group in the Courses of Business Administration and Accounting figured percentages of 84,6% and 72,9% respectively.

4.9 Gender of the Research Responders

Figure 03 evidences that most students interviewed are male, 59,1%, which corresponds to 175 responders.

Figure 03: Gender of the Research Responders



This means that the percentage of female students is of 41%; that is, 121 women interviewed throughout the research. Crossing the sexes, was asked if respondents use rainwater in activities at home and whether they adopt recycled bags when shopping or equivalent items in 4.10 and 4.11, respectively.

4.10 Reuse of Rainwater (Per Gender)

As shown in the table 08, it could be concluded that a considerable percentage, which corresponds to 84,6% of men and 89,3% of women, do not store rain water for house purpose practices. Only 15,4% of men and 10,7% of women use rain water for home activities.

Table 08: Reuse of Rainwater (Per Gender)

Answers	Male	Total Male (%)	Female	Total Female (%)	General Total (%)
Do not use rain water	148	84,6%	108	89,3%	86,5%
Use of rain water	27	15,4%	13	10,7%	13,5%
Total	175	100,0%	121	100,0%	100,0%

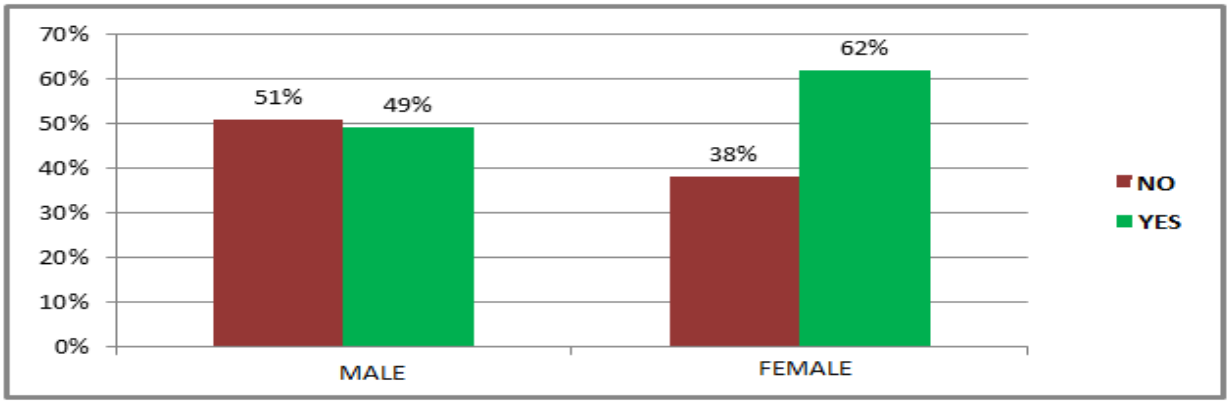
Observing the sample, only 13,5% of the respondents using rain water, mainly for cleaning purposes such as clean the sidewalk in from of the house as well as to wash the family car. Such results evidence that rain water could be better used in the house of the responders.

4.11 Reuse of Packages and Equivalents per Gender

With regards to the reuse of packages and equivalents at home, the figure 04 demonstrates that nearly half of male responders reuse bags or equivalents, in other words, 49%.

When it comes to female, the majority (that corresponding to 62% of the responders), reuse packages or equivalents, which evidences that women are more environmentally-conscious than men.

Figure 04: Reuse of Packages and Equivalents per Gender



In general, more than half (which corresponds to 54% of the responders), reuse packages and equivalents at home.

5. Conclusion

It is very important that the university realize constantly activities that comprise themes related to environmental preservation. Thus, the promotion of seminars, lectures and other academic activities are recommendable in order to develop perception general people regarding issues of environmental preservation.

Notwithstanding the fact that 68,4% of research responders showed constant interest on issues related to environment, 61,5% of them do not take part in any activity or lecture in environmental preservation between years 2009 to 2011.

The essay evidenced that 85,8% of students use plastic bags when going to the supermarket and only 13,2% make use of reusable bags.

The research results point out differences with regards to the environmental-oriented behavior among men and women.

When addressing the reuse of wastes at home, 62% of women reuse used material for house purposes, which lies against 49% male responders.

With regards to rain water use at home, it was found that 15,4% male scholars use rain water. With women, such percentage is of only 10,7%. Activities such washing the sidewalk and the car were the most commented.

This article aimed at investigating the environmentally-oriented behavior of students the Business Administration, Biology and Accounting Courses at the Federal University of Maranhão – (FUM), which demonstrates that the students addressed are limited regarding many aspects related to environmental care even though they consider it a relevant issue.

Facing this scenario, environmental education at FUM requires more efficient promotion and better explored in order to contribute significantly to the academic education of its students. For future researches, it is suggested that the number of courses assessed are widened as well as the inclusion of other Institutions of Higher Education (IHE).

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