Sustainable Development
Environmental Values Among
Yarmouk University Students

Dr. Nawal Issa Okourd
Abstract
This paper aims at examining the acquired level of environmental values and ethics (EVEs) regarding Environmental Balance (EB) by the 4th level students in the three faculties (economy, education and science) at Yarmouk University (YU) in Jordan. The sample consisted of (232) students, (99) male and (133) female of the 4th level in the three previous faculties. The sample was selected randomly by the “Stratified Random Sample” method in the light of several variables. The researcher used two instruments; a list of EVEs as a basic tool for students’ test, and a constructed test of four multiple choice consisted of (20) items for examining the level of students’ EVEs. The reliability of students’ test was verified by using "Cronbach-Alpha". Means, standard deviations, percentages, and Two Way ANOVA (TWA) test were used to analyze data. The results revealed high level of students’ awareness and acquired EVEs, closed to the requested criteria level (80%). The results disclosed no statistical differences in acquiring EVEs regarding sex, place of living, and their faculties. In the light of this study and its objectives, the researcher recommended and suggested a number of recommendations and suggestions.

Introduction
The breakable state of practical researches in environmental ethics, at the academic level in Jordan, stimulated the researcher interest in carrying out the present research. This research aims at examining the level of students acquired EVEs at Yarmouk University (YU). This study is not going to deal with all EVEs, as this would necessarily require a more extensive work. Therefore, it is practical to restrict this paper to the aspect of environmental balance. This paper exposes a background dealing with Environmental Education (EE) and Environmental Values and Ethics (EVEs). Followed by, the results and their discussions, in addition, the conclusion and recommendations.

Background
Many differences differentiate human beings from other forms of life. The ability to learn is a unique feature that has enabled man to evolve to become the foremost of all the creatures on earth. Garaibih and Farhan (2000) indicate that man has always had the desire to use natural resources to improve his quality of life. With increasing exploitation, some of the resources have become depleted, endangering their ability for self-renewal to maintain the natural balance.

Brake (1997) states that man turns the natural resources available to him into more useful products, in the processes, unfortunately, often creating pollution. Over the years, Faqhi (1993) states, the pollute has increased, to the extent now that it threatens his very existence globally. Dealing with the
pollution, Subbarini (1990a) indicates, would require collaboration and cooperation at the national, regional and international levels. There should also be a proper strategy to prevent future problems that may arise from, for example, the present waste disposal so as to ensure sustainable development. Subbarini (1998) argues that awareness of this problem is rapidly growing, and, with it, recognition of the need for scientific, technical and economic information with which to develop the ways to ameliorate or even to improve the situation.

The World Commission Strategy (WCS) identified environmental education (EE), both formal and informal, as a tool for achieving sustainable development (SD) and called for its incorporation in education curricula at all levels to enable students to observe, protect and monitor the environment (Palmer 1999). WCS (1987) in its “Common Future” report warns that meeting our present needs should not jeopardize the abilities of future generations to satisfy their own needs.

Many environmental educators like Brown (1994), Subbarini (1998), Blate (1992) and Palmer (1998, 1999) assert the role of EE in protecting the environment. They indicate that EE constitutes one of the main pillars for protecting and safeguarding the environment. Thus, the strategy came about to emphasize environmental awareness (EA) and use it to mould attitudes, values and knowledge to achieve sustainable development (SD).

On the other side, UNCED (1992) reports that the Earth Summit was held in Rio De Janeiro, Brazil in 1992, a conference that asked for applying the strategy of sustainable development (SD) through its agenda 21. It maintains that many principles were articulated in its program agenda 21 to achieve SD at the national and international levels. Goodland (1995) says that a number of issues were discussed, such as education within SD in order to become sustainable development education (SDE), and the integration between the development and environment.

In 1993, Palmer and Neal (1994) argue that in the period 1990s, many national strategies were formulated in developed and also in a number of developing countries asking for EE to encompass the wider concept of SD. So, with the greater environmental (EA) and environmental values and ethics (EVEs) instilled, a balance can be struck between the environment and development.

Regarding Environmental Values and Ethics (EVEs), Sterling (1996) signalizes that environmental responsibility can be inculcated at the individual and group levels by promoting a positive attitude towards nature and its ecosystems.

Sterling (1996) states that the key for achieving the above-mentioned goals is rooted in “education” which can polish the minds of the coming generations to be allies and partners in possible solutions for protecting the environment. Sterling argues, education must be veered towards SD so that can be verified by the environmental knowledge and concepts learned. These
environmental concepts as Hague (2002) indicates are acquired from the discussions of environmental issues as real-life problems, which possibly have engendered some empathy with the environment that is likely to be mirrored in the EVEs.

Des Jardins (1997) focuses on studying ethics in order to limit people demands on nature to not only as independent entities, but also as moral agents who are responsible for their actions. In this way, all the interests are respected in the present and future. Des Jardins (1997:85) states “some of the most pressing environmental challenges are to consider in detail the ethical effects of our action on people in the future. Yet, this issue was often ignored in much traditional philosophy”.

Consequently, many ethicists, such as Rolston (1988); Callicott (1989,1995) and Park (2001) formulate their ideas perspectives, views and paradigms into ethical theories for teaching students to become environmental citizens. They encompass three approaches – academic, for environmental ethics to be achieved by EE in a life-long process; philosophical, to analyze the academic approach by comparing various views to extract common ethical perspectives, and, finally, psychological, to reflect the social side by developing new methods for examining EVE in empirical studies.

A number of studies are conducted in this field such as (Szagen & Pavlov 1992; Abdullah 1992; Fong 1993; Zimmerman 1996) aimed at identifying the acquired environmental values of the studies' subjects. Meyers (2002) aimed at developing EV’s typologies to close the gap between EVs and psychological ones, and to measure adult’s values and willingness towards environment.

The results of (Fong 1993; Szegun & Pavlov 1992) were positive in acquiring EVEs. The results of Szegun & Pavlov (1992) also showed, the preparedness of German students to protect their environment is higher than Russian Students’. Regarding to sex, the results of some studies revealed the effect of sex, the females have got higher level than males, e.g., (Fong 1993; Szegun & Pavlov 1992), while the study of Zimmerman (1996) showed the higher level for male students. On the other hand, there were no statistical differences between male and female in the study of Abdullah (1992). With regard the field of study, the results of Abdullah’s (1992) also reveal that the scientific section got higher level than literal section.

At the individual level in Jordan, the public is aware of the risk it is bringing on itself by polluting the environment. This awareness is reflected by many educators at academic level at YU such as Reid and Sa’adi (1997), Subbarini (1990, 1992, 1998) and Subbarrini et al. (1993) calling for environmental awareness and attitudes to be accepted by shifting away from the traditional teacher-centered approach to, instead, a student-centered approach, and from objectivism to constructivism which matches the EE strategy. It looked
for imparting scientific knowledge in an evidence-based way by considering real-life problems. Today, EE as an interdisciplinary approach is emphasized at Jordanian schools in response to global thinking that EE can mould environmental ethics. This approach, Subbarrini et al. (1993), encourages outdoor activities, teamwork and critical thinking to make approachable and responsible students by instilling in them a sense of pride in their environment.

Despite the previous studies conducted, as mentioned before, EVEs have not been given sufficient attention in Jordan, particularly at YU level, and the number is not enough to bridge the gap existing in the field of environmental ethics. The few studies in EVEs, probably due to the lack of tools for measuring the performance parameters, have left gaps many researchers are trying to fill. A problem faced is that the concern of EVEs is in its infancy because of the still lukewarm interest in EE. In this respect, the plans of YU to help students acquire EVEs are an important topic to discuss. The researcher intends to delve into this rare subject to assess the students' acquisition of EVE in YU.

Objectives of the Study
This study aims to assess the level of EVEs acquired by 4th level students at YU in Jordan. The specific objectives are summarized as follows:

1. To list EVEs practices derived from SD ethics that are compatible with Islamic ethics contained in the Holy verses and Prophetic speeches.
2. To examine the level of EVEs acquired by YU students by different variables (gender, residency, and faculties).

Questions of the study
To achieve the previous objectives, the following questions are set up:

1. What is the level of EVEs acquired by the 4th level students, and their sources of knowledge at YU?
2. Are there any statistical differences in EVEs acquired by sex (male and female)?
3. Are there any statistical differences in EVEs acquired by resident (rural or urban students)?
4. Are there any statistical differences in EVEs acquired by science, education and economics students?

Operational Definitions
The following terms are defined below:

**Environmental Education (EE).** The process of acquiring knowledge, values, attitudes, commitments and skills needed to preserve and conserve the
environment. EE also aims to encourage pupils to examine and interpret the environment from various perspectives so that the increased environmental awareness can be made use of to resolve environmental problems (NCC 1990:3). EE finally aims at providing all the pupils with the opportunity to acquire the knowledge, understanding and skills required to engage effectively with environmental issues, including SD (SCAA 1996a:2).

The researcher defines EE as an educational approach for developing the relationship between humans and nature. An EE strategy can stimulate active responsibility, raise environmental awareness and acquire commitment towards nature and its components by using an expansive range of teaching and learning techniques.

**Sustainable Development (SD)** is development that meets the needs of the present generation without compromising the ability of future generations to meet their basic life while living within the carrying capacity of the supporting ecosystem” (IUCN/UNEP/WWF 1991:10).

**Environmental values and ethics (EVEs)** are positive limitations towards persons, continually being molded in people throughout their interaction with environmental elements (Abdullah 1992). In the present study, EVEs is a code of ecological and sustainable values compatible with individual religious beliefs and cultures. These values are positive behaviors towards natural and artificial environments, valuing environmental protection and its balance.

**Environmental Balance Aspect** refers to the sum of EVEs and behaviors that enables each student to acquire his emotional feeling and values for the environment. They instill in the student a pro-active attitude towards nature as a balanced and integral system. This balance should always be maintained in the environment, preserving biological diversity, being environmentally aware and having good environmental values.

**Yarmouk University (YU)** a government university in Irbid city in the north of Jordan. It has the faculties of science, engineering, religion, law, economics, education, arts, social sciences, and information technology. However, only students from three of the faculties are assessed in this work – from the faculties of science, economics and education.

**4th Level Students** are final year students in the 2004/2005 academic year from the three faculties of concern.

**Criteria Degree** is the level of EVE acquired by the students. It was verified by a panel of judges from YU. A committed student should score above 80 percent.
Significance of this Study
This study is very important for scholars, educators, and decision makers because the problem it deals with is persistent and crucial in the realm of environment. A code of EVEs has been drawn up from ecological SD compatible with Islamic ethics. This study is probably the first of its kind at the Jordanian universities in general, and at YU in particular. Its importance is derived from the need for EVEs to save the earth. As no previous studies have attempted to answer the questions posed in the present study. The results may help mould the future vision for teaching and learning within the development process. This work may pave the way for the professional development of those interested in environmental ethics.

Scope of the Study
The study is limited by the following:

1. Only 4th level students of science, economic and education at YU were involved – 232 out of the total university enrollment of 1,160. The size of the sample is not large enough for the results to be generalized for all universities. Perhaps but it is one that is managed and would be sufficient to validate the findings for specific universities in the north.
2. The instrument used was multiple-choice test including 20 EVEs which is developed by the researcher himself.
3. The material or this study is limited to 20 EVEs taken from analyzing ethics of environmental theories and SD that are compatible with Islamic environmental values

METHODS AND PROCEDURES

The Students' Population and Sample
They are the students of the three faculties (science, education, economy) who were enrolled in the second semester (2004-2005) at YU. The males are 499, while the females 661 with the percents of 43 and 57 respectively. The population was distributed according to sex and the field of study. The sample of the 4th level students is about 232 males and females; it formulates 20 percent of the study's population. The sample was selected via the “Stratified Random Sample”, which was identified by Rumrili and Cook (2001:35): "stratified sampling may be used to enhance the representativeness of a sample in relation to population characteristics that are known".

Study’s Instruments
The study’s instruments consist two:
The Basic List of EVEs

It is a list of EVEs that was built by the researcher in order to construct the students' test. The items of the list were elucidated from the international values of SD and its agenda 21 that are compatible with Islamic ethics. The draft with 30 EVEs was exposed to a panel of judges at YU in Jordan and at UKM in Malaysia, who were requested to obtain the suitable place addressed by three categories (less important, important, strongly important) with 1, 2, 3 grades respectively. The EVEs of 2 and 3 grades were obtained, while the EVEs of 1 grade were ignored.

The reliability and the validity of this list were verified by the previous panels who asserted the suitability and its inspiration to meet the purposes of this study. Moreover, their views and comments regarding the contents and the constructions of items were taken into the researcher consideration. The basic validated version, before the validity of students’ test, became 25 EVEs, it was the criterion for the major instrument’s items (students' test). These EVEs are reduced to 20 EVEs - after the procedure has been taken for the reliability of students' test.

In order to know its compatibility with Islamic environmental values, another list of Holy verses and Prophetic says was added to the EVEs' list. They were exposed to another "panel of judges" from science and religious faculties to choose the suitable values that are well-matched with the previous global values. The panel of judges confirmed the harmonizing between the two kinds of values; they commented that the Holy speech embedded EVEs implicitly or explicitly.

The Students' Test

To measure the level of the students in acquiring EVEs, the researcher considered the previous EVEs items in the basic list above. It was planned for designing the present test from reviewing many sources related to EVEs and attitudes locally and globally. The researcher constructed a test of 30 items of multiple choice-tests; it is distinguished with flexibility and capability to measure educational outcomes of values and attitudes-related to the items in the previous list of EVEs (Odeh & Malkawi 1991).

The test was exposed to a" panel of judges "at YU and UKM in order also to affirm the constructed and contented validity. They were asked to write in details their comments and suggestions. Their comments and suggestions were taken into consideration, used to improve the content and the construction of the test throughout concentrating on the suitable domain for each item, clarity, and the language problems. Finally, the suitability of the final version was emphasized to examine the acquired EVEs of students sample at YU. As a result, the items were 25 multiple choice questions before the reliability has been achieved. Each item in the test has four levels of value (commitment, preference, acceptance, before valuing) with 4, 3, 2, 1 degrees correspondingly.
For achieving the internal consistency reliability of the EVE's test, Cronbach alpha coefficient was computed for 25 items that have applied on 50 students outside the sample. Alpha coefficient became 0.80 after deleting 5 items because their value in the "corrected item total correlation" was less than 0.2 that led into failing the" corrected item total correlation." Finally, the last version of the students test included 20 multiple choice questions. A number of instructions and guidelines were set up revealing the purposes of the test and other personal information. Appendix B shows this test that is composed of four subheadings of EVEs; "Environmental Cooperation", "Taking Care of Biological diversity", “Environmental Awareness”, and "Environmental Valuation". The form of key answers (a, b, c, d) was attached as in Appendix C. Consequently, the previous basic list of EVEs became 20 EVEs also.

**Research Framework and Variables**

EVEs are considered a branch of other values. What is said about values could also be applied on EVEs. The researcher is adopting Khrathwol’s classification for environmental values. This classification is considered the most popular one within the educational fields. The following two levels of values are likely to be mentioned here as they are taken into account:

**Before value’s formative levels**
- Receiving Attending (awareness, willingness to receive, controlled attention).
- Responding (acquiescence in responding, willingness to respond, satisfaction in respond).

**Valuing levels**
- Acceptance
- Preference of value
- Commitment; that is adopted according to this thesis, but regarding (acceptance and preference) levels, they are considered above the awareness level.

The framework of the present study is based also on Abdallah (1992) framework for evaluating values. Using this framework helped me in constructing the previous students' test, and to understand the procedure in using the previous levels of values.

The study suggests criteria of three levels (validated by the previous panel and other experts) that are considered as valuable in guiding the researcher to evaluate students' awareness and ethics towards nature and its components.
Before value' formative level is considered, in this study, the surface level of awareness. The second level valuing is considered highly aware if it is placed within the acceptance and preference levels, and above that it will be considered in the commitment level (obligation, above 80%). Table 1 exhibits the criteria of these levels.

Table 1: Students Levels Criteria in Acquiring EVEs

<table>
<thead>
<tr>
<th>The levels of EVEs</th>
<th>Mean score</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment</td>
<td>Above 3.2</td>
<td>Above 80</td>
</tr>
<tr>
<td>Preference</td>
<td>2.8-3.196</td>
<td>70 -79.9</td>
</tr>
<tr>
<td>Acceptance</td>
<td>2.4-2.796</td>
<td>60 -69.9</td>
</tr>
<tr>
<td>Before value’ formative level</td>
<td>2.0-2.396</td>
<td>50 -59.9</td>
</tr>
</tbody>
</table>

Regarding the variables, this study dealt with the following variables:

- Independent variables, are believed to cause, influence or lead to variation in the dependent variable. They are the local and academic sources and exposure of acquiring EVEs as predictor variable.
- Dependent variable, the students' level in acquiring EVEs. It is hypothesized under the influence of independent variable.
- Moderating variable, are three variables as independent variables which are thought to modify the relationship between the dependent and independent variable. It turned to as conditional variables.

Statistical and Analytical Methods

For analyzing data, the researcher used the following statistical methods:

1. For answering the 1st question, the researcher used frequencies, percentages, ranks, means, and standard deviations.
2. For answering the 2nd, 3rd, and the 4th questions, and to know the interaction regarding sex and other variables –resident, specialty, the researcher used Two Way ANOVA(TWA) test.

FINDINGS AND DISCUSSIONS

The study shows the following results:
FIRSTLY: FINDINGS RELATED TO QUESTION NO.1: *LEVEL OF EVEs ACQUIRED BY THE 4TH LEVEL STUDENTS, AND THEIR SOURCES OF KNOWLEDGE*

The mean scores, percentages and rankings are computed. Table 2 shows the responses by the students in acquiring EVEs regarding Environmental Balance(EB) field.

Table (2) Levels of EVEs Acquired by 4th Level Students at YU in Environmental Balance Field (n = 232)

<table>
<thead>
<tr>
<th>No</th>
<th>EVE</th>
<th>Mean</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Environmental Balance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Voluntary participation for protecting environment</td>
<td>3.20</td>
<td>80.00</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>Working in team spirit</td>
<td>3.13</td>
<td>78.25</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>Cooperation for meeting the necessary needs</td>
<td>3.14</td>
<td>78.50</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>Cooperation for protecting environmental systems</td>
<td>3.31</td>
<td>82.75</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Sustainable development for using biodiversity</td>
<td>3.06</td>
<td>76.50</td>
<td>23</td>
</tr>
<tr>
<td>6</td>
<td>Encouraging keeping of pets</td>
<td>2.19</td>
<td>54.75</td>
<td>49</td>
</tr>
<tr>
<td>7</td>
<td>Taking care of wild areas from overgrazing</td>
<td>3.35</td>
<td>83.75</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>Taking care of wild animals and birds</td>
<td>3.05</td>
<td>76.25</td>
<td>24</td>
</tr>
<tr>
<td>9</td>
<td>Taking care of wild plants</td>
<td>2.44</td>
<td>61.00</td>
<td>48</td>
</tr>
<tr>
<td>10</td>
<td>Taking care of endangered species</td>
<td>3.38</td>
<td>84.50</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Aware of greenhouse gas problem</td>
<td>3.13</td>
<td>78.25</td>
<td>19</td>
</tr>
<tr>
<td>12</td>
<td>Aware of poverty problem</td>
<td>3.10</td>
<td>77.50</td>
<td>22</td>
</tr>
<tr>
<td>13</td>
<td>Aware of land reclamation problem</td>
<td>2.93</td>
<td>73.25</td>
<td>27</td>
</tr>
<tr>
<td>14</td>
<td>Aware of desertification problem</td>
<td>3.15</td>
<td>78.75</td>
<td>16</td>
</tr>
<tr>
<td>15</td>
<td>Aware of population problem 21</td>
<td>3.10</td>
<td>77.50</td>
<td>21</td>
</tr>
<tr>
<td>16</td>
<td>Committing of medical check up before marriage</td>
<td>3.50</td>
<td>87.50</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>Aware of environmental education</td>
<td>2.59</td>
<td>64.75</td>
<td>39</td>
</tr>
<tr>
<td>18</td>
<td>Valuing environmental and natural systems</td>
<td>3.28</td>
<td>82.00</td>
<td>9</td>
</tr>
<tr>
<td>19</td>
<td>Valuing the role of science and scientists in protecting the environment&quot;</td>
<td>3.69</td>
<td>92.25</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>Valuing human responsibility towards the environment</td>
<td>3.31</td>
<td>82.75</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3.13</td>
<td>78.25</td>
<td>1</td>
</tr>
</tbody>
</table>
The students' commitment to the environment scored 78.25 percent, close to the level of excellence (80%). On the other hand, their awareness of EVE was over the preference level 70 percent. Thus, the students have feeling for their environment, they do practice fair ethics towards it.

The environmental balance (EB) field obtained this good result, with eight of the individual EVEs (1, 4, 7, 10, 16, 18, 19, 20) scoring above 80 percent. The highest was for the item (19) “valuing the role of science and scientists in protecting the environment” with mean score (3.69) and 92.25 percent, which reflected the vast scientific progress made in all Jordanian walks of life. This was followed by the item (16) “commitment for medical check up before marriage” with mean score (3.50) and 87.5 percent, indicating the concern over health in Jordan and the region with the establishment of advanced medical hospitals with highly regarded medical institutions. Furthermore, adopting this EVE is mandatory by law for both males and females in Jordan with all marriages to be supported by a medical certificate. The 3rd EVE in this sector was the item (10) "protecting endangered species" with a score of (3.38) and 84.5 percent.

The reasons for these results can be ascribed to the students' age – the love of the young for their environment – reinforced by YU’s participation in several biological diversity programs which made the students generally aware of most of the environmental problems.

The adequate EVEs of the students can be due to their high awareness of their environment, and their participation in environmental activities as part of their education. The participation could have been by attending seminars and taking part in collective programs at YU. The highest EVEs were on the wilderness, probably due to the stimulating effects of Jordanian TV programs on protected areas, e.g., Dana and Al Azraq. The students were also aware of social problems with their high response for having medical check-ups before marriage. The good awareness of the students on these issues can be attributed to the acquisition of basic knowledge, either from textbooks and courses, or sources similar to religious books.

The lowest score was for the item (6) “encouraging the keeping of domestic pets” with only (2.19) mean score and 54.75 percent, possibly because Jordanians in general are busy getting on with their lives with little time for pets.

These results agree those of Zimmerman (1996) who attempted to identify the environmental values held by students in the University of Mexico. He found a positive level for students in acquiring EV. The result also agrees with those of Szegun and Pavlov (1992) who tried to assess EVEs in Russian and
German students, and find out their preparedness to protect their environment themselves. They also found positive level for their students in acquiring EVEs.

On the other hand, these results differ from Khataybeh and Gaood (2000) who attempted to assess students’ knowledge and attitudes towards the environment at YU. Their result is far a way from the validated level (80%). The reasons for the differences between the present study which scored high level of awareness, and Khataybeh & Gao’od (2000) study may be ascribed to time. Their study was conducted five years ago in comparison with the present study. In the instant period of time, MoE realized the importance of upgrading EE in its curricula as indicated in (chapter II). Moreover, the multimedia means which emphasized the necessity for EA to conserve protected areas for preserving the national biodiversity. Finally is the current fervor of the Jordanian government in organizing environmental conferences, both locally and globally.

SECONDLY: FINDINGS RELATED TO QUESTION NO.2: STATISTICAL DIFFERENCES IN EVES ACQUIRED BY SEX (MALE AND FEMALE)
For comparing sex difference in acquiring EVEs, Two Way ANOVA (TWA) test was used (Table 2). As the mean score of male students is 146.66 with the percent 73.33, the mean score for female students is 147.27 with the percent 73.64, while the total mean score is 147.01 with the percent 73.5. Table 3 shows no significant difference between the mean scores for male and female students in acquiring EVEs. The computed F is 1.716, while the critical F, at α =0.05 level, is 3.86.

Table 3: TWA for Students Acquisition of EVEs by sex and Resident And their interactions in EB

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III sum Of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>.168</td>
<td>1</td>
<td>.168</td>
<td>1.716</td>
<td>.191</td>
</tr>
<tr>
<td>Resident</td>
<td>.074</td>
<td>1</td>
<td>.074</td>
<td>.753</td>
<td>.386</td>
</tr>
<tr>
<td>Sex Resid</td>
<td>.001</td>
<td>1</td>
<td>.001</td>
<td>.010</td>
<td>.919</td>
</tr>
<tr>
<td>Error</td>
<td>22.323</td>
<td>228</td>
<td>.098</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No statistical differences between male and female students in acquiring EVEs was not surprising as both sexes now have the same rights in all aspects of life, no longer the male-centric society of the past. Both are obligated to study in their formative years, during which they have the same opportunities in education. With similar education, the environmental programs on TV could inspired both in their acquisition of EVEs.
These results agree with Abdullah (1992) study on environmental values acquired by the students in Zagazig University, Egypt with no differences between males and females. They also agree with Zimmerman (1996) who also found no differences between males and females in acquiring environmental ethics. However, Szegun and Pavlov (1992) found females to be better in acquiring EV, possibly because the study was done in Europe. And in developed countries women are more concerned about the environment than men, being mainly responsible for raising their children. In general, women, endowed with more emotion and being more sensitive than men, thus, have more environmental empathy.

THIRDLY: FINDING RELATED TO QUESTION NO.4: STATISTICAL DIFFERENCES IN EVEs ACQUIRED BY RESIDENT (RURAL OR URBAN STUDENTS)

TWA test was used to compare between the two means of urban and rural students in acquiring EVEs and their interaction with sexes. As the mean score of rural students is (156.0) with 78.00 percent and urban students (154.0) with 77.00 percent.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Rural (44)</th>
<th>Urban (55)</th>
<th>Total (99)</th>
<th>Rural (58)</th>
<th>Urban (75)</th>
<th>Total (133)</th>
<th>Rural (102)</th>
<th>Urban (130)</th>
<th>Total (232)</th>
</tr>
</thead>
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<tr>
<td>Male</td>
<td>3.09</td>
<td>3.06</td>
<td>3.15</td>
<td>3.11</td>
<td>3.12</td>
<td>3.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>77.50</td>
<td>76.50</td>
<td>76.82</td>
<td>78.75</td>
<td>78.00</td>
<td>78.25</td>
<td></td>
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<td></td>
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<tr>
<td>%</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td>50.00</td>
<td></td>
<td></td>
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</table>

Table 3 shows no statistical differences between the responses in the field of EB by resident and their interaction with sex, the computed F is 0.753, while the computed F for the interaction is 0.01. The critical F for both is 3.86 at α =0.05. The lack of difference could be attributed to the fact that both rural and urban students have more or less the same standard of life. Jordan is considered an urban community with over 80 percent of its population living in cities and only 20 percent rural. The high standard of living in the cities is also available in villages due to the evenhanded treatment of the two communities by the government. Further, there is no distinction between them because everyone has the same constitutional rights.
Regarding to resident, the results agree with Zimmerman (1996) who also found no differences between rural and urban, and male and female students. However, Khataybeh and Gaood (2000) found a sex and resident interaction with rural/male students coming out tops in their environmental attitudes. The difference in results may have resulted from the points explained previously in discussing the second question. The fast development in curricula and mass media focused on environmental problems locally and globally could promote the nowadays public awareness and ethics towards environment.

FOURTHLY: FINDINGS RELATED TO QUESTION NO.4: STATISTICAL DIFFERENCES IN EVEs ACQUIRED BETWEEN SCIENCE, EDUCATION, AND ECONOMICS STUDENTS

The analysis of the responses is given in Table 5. To gauge the differences between the students of different faculties, Two Way ANOVA was done on the data and the results are shown in Table 6.

Table 5: Mean Scores of Students' Answers Due to Sex and Specialty

<table>
<thead>
<tr>
<th>Sex</th>
<th>Field of study</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sci (19)</td>
<td>Edu (29)</td>
<td>3.07</td>
<td>3.18</td>
<td>3.01</td>
</tr>
<tr>
<td>Eco (51)</td>
<td></td>
<td>3.07</td>
<td>3.11</td>
<td>3.11</td>
</tr>
<tr>
<td>Total (99)</td>
<td></td>
<td>3.17</td>
<td>3.14</td>
<td>3.12</td>
</tr>
<tr>
<td>Sci (80)</td>
<td>Edu (13)</td>
<td>76.75</td>
<td>79.50</td>
<td>75.25</td>
</tr>
<tr>
<td>Eco (40)</td>
<td></td>
<td>77.75</td>
<td>79.25</td>
<td>78.5</td>
</tr>
<tr>
<td>Total (133)</td>
<td></td>
<td>77.80</td>
<td>77.50</td>
<td>76.50</td>
</tr>
<tr>
<td>Sci (99)</td>
<td>Edu (42)</td>
<td>3.18</td>
<td>3.10</td>
<td>3.10</td>
</tr>
<tr>
<td>Eco (91)</td>
<td></td>
<td>3.06</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Field%  

| EB     | 76.75| 79.50  | 75.25 |
|        | 77.75| 79.25  | 78.5  |
|        | 77.80| 77.50  | 76.50 |

Table 6: TWA for Student Answers in EB Field (n=232)

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III SS</th>
<th>df</th>
<th>M.S</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>.110</td>
<td>1</td>
<td>.110</td>
<td>1.144</td>
<td>.286</td>
</tr>
<tr>
<td>Faculty</td>
<td>.283</td>
<td>2</td>
<td>.142</td>
<td>1.470</td>
<td>.232</td>
</tr>
<tr>
<td>Sex x</td>
<td>.162</td>
<td>2</td>
<td>.081</td>
<td>.841</td>
<td>.432</td>
</tr>
<tr>
<td>Faculty</td>
<td>.21.769</td>
<td>226</td>
<td>.096</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There is no significant difference between the mean scores in acquiring EVEs with regard to the field of study. Practically, it could be seen from table 5 that education students have got the higher, followed by science students. The result could be because the education students had been exposed to more education styles than the other students, and also in more subjects. They may well have learnt concepts, skills, attitudes and values obtained from the offered elective course (103) in EE.
The science students came out second best. The science faculty offers many environmental subjects, including an elective course “Environmental Science” for all faculties that may be ignored by students. The reason for such result could be attributed to the fact that students study their courses conventionally in order to gain knowledge and higher grades. The economics students fared the worst that could be ascribed to the fact that their disciplines focus on financial activities for profits, neglecting the environmental issues. All this is ironical as economics students should have scored the most because of a global slogan for ecological economy.

In actual fact, however, the previous courses of EE and environmental science are not sufficient for inculcating EVEs, as indicated by Khataybeh and Gaood (2000).

The results of this study disagree with Khataybeh and Gaood (2000), and Abdullah (1992) who studied the acquisition of environmental values by the field of study of their respondents. All of them found that the best were the respondents in science, while this study practically found the students in education to be the best. This may be because Egypt (where Abdullah did his study) is the most advanced Arab nation and the surfeit of information on the environment available has made everyone equally aware of the issues involved.

The difference in results between this study and the past ones may be because most of them were done in developed countries which, generally, are more environmentally conscious and which people have more environmental ethics.
CONCLUSION

The present paper was conducted at YU, dealing with rare subject that was ignored at the realm of environmental studies. The study is important from more than one point of view. The problem of EVEs has intrinsic importance that affecting people and organizations. This study shifts from theoretical ethics into practical one, examining students EVEs, based on ethical theories that have been widely accepted but little tested.

Moreover, the methods that have been chosen for this study have not been widely used in our profession, and this study yields some useful instruments and tools, e.g. the basic list of EVEs and students’ test.

The result revealed the high awareness level of students toward their environment, and their committing of EVEs (78.25) is nearly touch the criteria level (80 %), thus, they have some practice for their environment. The result also revealed no statistical difference between male and females on one side. On the other side, no differences regarding to resident’s and the field of study’s variables.

Despite the limitations of this study in dealing only with YU and its three faculties, and in extracting a code of some EVEs its results are meaningful. They seem to be of value for lecturers by implying EVEs as multidisciplinary approach while dealing with environmental subjects on one hand. On the other hand, implying them in curricula as an interdisciplinary approach while planning for designing curricula. Regarding the decision makers, the side of EVEs could be implied while scheduling and designing small and large programs and projects.
REFERENCES

APPENDIX A
THE FINAL LIST OF THE GLOBAL EVES

<table>
<thead>
<tr>
<th>N</th>
<th>Environmental values and ethics</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>The first aspect: environmental balance</td>
</tr>
<tr>
<td></td>
<td>Environmental cooperation</td>
</tr>
<tr>
<td>1.</td>
<td>Voluntary participation for protecting environment</td>
</tr>
<tr>
<td>2.</td>
<td>Working in team spirit</td>
</tr>
<tr>
<td>3.</td>
<td>Cooperation for meeting the necessary needs</td>
</tr>
<tr>
<td>4.</td>
<td>Cooperation for protecting environmental systems</td>
</tr>
<tr>
<td></td>
<td>Taking care of biological diversity</td>
</tr>
<tr>
<td>5.</td>
<td>Sustainable development for biodiversity</td>
</tr>
<tr>
<td>6.</td>
<td>Encouraging cultivating domestic animals</td>
</tr>
<tr>
<td>7.</td>
<td>Protecting wild areas from overgrazing</td>
</tr>
<tr>
<td>8.</td>
<td>Protecting wild animals and birds</td>
</tr>
<tr>
<td>9.</td>
<td>Protecting wild plants</td>
</tr>
<tr>
<td>10.</td>
<td>Protecting endangered species</td>
</tr>
<tr>
<td></td>
<td>Environmental awareness</td>
</tr>
<tr>
<td>11.</td>
<td>Aware of green house gas problem</td>
</tr>
<tr>
<td>12.</td>
<td>Aware of poverty problem</td>
</tr>
<tr>
<td>13.</td>
<td>Aware of land reclamation problem</td>
</tr>
<tr>
<td>14.</td>
<td>Aware of desertification problem</td>
</tr>
<tr>
<td>15.</td>
<td>Aware of population problem</td>
</tr>
<tr>
<td>16.</td>
<td>Committing medical check up before marriage</td>
</tr>
<tr>
<td>17.</td>
<td>Aware of environmental education</td>
</tr>
<tr>
<td></td>
<td>Environmental appreciation</td>
</tr>
<tr>
<td>18.</td>
<td>Valuing environmental and natural systems</td>
</tr>
<tr>
<td>19.</td>
<td>Valuing the role of science and scientists in enhancing the environment</td>
</tr>
<tr>
<td>20.</td>
<td>Valuing human responsibility towards environment</td>
</tr>
</tbody>
</table>
APPENDIX B
THE STUDENTS EVES’ TEST

Dear student

Regards

In your hands 50-items test for measuring the range of your commitment towards environmental components, you are asked to answer all those items by drawing a circle around the suitable option that you believe for each item (question).

Your answers in this test will be processed under perfect privacy and in a case that you want to look through the results of this study; you can contact the researcher at the following e-mail:

okornawal@yahoo.com

Your consideration is highly appreciated

First section: General information:

1. Sex: [ ] Male [ ] Female

2. Faculty: [ ] Science [ ] Education [ ] Economy

3. Study level: 4th level

4. Permanent house place: [ ] Rural [ ] Urban

Circle the believable and suitable option in the following questions:

1. If you have been asked to participate in environmental protection projects, what shall you do?
   a) I prefer to be an honor member only.
   b) I encourage participation in taking decision only.
   c) I prefer the large integrated voluntary works.
   d) I participate actually in the voluntary works even they are simple.

2. The Royal Scientific Jordanian Society (RSJS) for protecting nature reflects Jordan environmental interests, it set up environmental decisions which:
   a) Must be independent from the opinions of Jordanian people.
   b) Preferably being compatible with the opinions of society and its needs.
   c) Indeed being compatible with the opinions of society and its needs.
   d) Make me sad when being independent from Jordanian people opinions.
3. The supporters of sustainable development ensure the cooperation between present and future generations, thus:
   a) I feel sad for meeting the necessary needs of present generations without considering future generations to get their basic needs.
   b) I accept meeting the necessary and unnecessary needs of present generations without taking care of the unnecessary needs of future generations.
   c) I commit meeting the necessary and unnecessary needs of the present and future generations.
   d) Meeting the needs of rich people with neglecting the needs of poor people is already preferred.

4. The cooperation between states and public to protect ecosystems, is the focal goal of sustainable development (SD). Therefore,
   a) I feel happy when the government cooperates with people to protect the environment.
   b) It is preferred, sometimes, government cooperates with people to protect ecosystems.
   c) No need for this cooperation because of the power of those systems to return their stability.
   d) It is very necessary to cooperate between all to protect environmental systems.

5. In 1993 the Convention of Biological Diversity (CBD) ensures protecting the biological species. What is your commitment towards this convention?
   a) I feel happy because this convention give concern to these species for the benefit of humans.
   b) I appreciate the goal of the convention which asks for protecting the species for present and future generations.
   c) I appreciate the goal of the convention which asks for protecting all species to conserve the environmental integration.
   d) I feel sad of overexploiting of this wealth.

6. Domesticated birds and animals are considered from the national biodiversity wealth. What is your opinion towards cultivating them?
   a) It is preferable to cultivate them within the boundaries of environmental scales.
   b) It is necessary to cultivate them for their importance in national economy.
   c) I prefer, part of people only adopt cultivating them.
   d) No need to cultivate them because they pollute the environment.

7. From the ways that eradicate the wildlife, the unfair grazing. My opinion towards this problem is:
   a) I feel sad for leaving the animals eat what they want from the wild plants.
   b) Preferring to forbid the animals from eating the wild plants to keep the balance of ecosystems.
   c) Leaving the animals eat what they want from those plants after their seeds composed.
   d) Preferring eating wild plants before composing their seeds if there was no food for animals.
8. The birds are from the beautiful creatures within biological diversity in Jordan, so that:
   a) I encourage hunting birds to put them in beautiful cages.
   b) I don’t commit of avoiding hunting them because they are lovely and interesting creatures.
   c) I feel very sad when I see them in cages.
   d) I avoid hunting them with my best, and I ask others to do so.

9. The wilderness and its components are considered natural resources that must be protected for its economic and scientific importance, so that:
   a) I leave a part of my garden for the wild plants and grass.
   b) I feel happy when I see the wild plants in my garden.
   c) I prefer making protected areas for wild creatures to take care of them.
   d) The developing economic projects are better than the natural reserves.

10. The modern life in Jordan leads into eroding the “Maha” deer and exposing them to the danger, so that:
   a) I prefer protecting the kind that recently endangered
   b) I prefer protecting their individuals without considering their species.
   c) Protecting these endangered species is a must to be considered.
   d) Protecting this type is costly and needs a lot of money.

11. The increasing demands on energy leads into the problem of global warming resulted from the gases emissions of CO2 and SO2, so that:
   a) I feel happy when decreasing the using of fuels in the public transportations and factories.
   b) I prefer decreasing the number of population in the cities.
   c) I ensure the committing of what coming in UNEP and WHO.
   d) The global warming is a local environmental problem, Jordan has no relation with it.

12. The poverty is considered one of the economic environmental problems in the developing countries, which is caused by the loss of the resources and the abuse in the economic management, so that:
   a) I feel happy when TV displays programs about how to treat such issue.
   b) I encourage talking about the poverty problem and getting rid of it.
   c) I contribute really in getting rid of this problem in the invested projects.
   d) It is very difficult to contribute in this issue because I am not poor.

13. From the local environmental problems, the reclamation of agricultural lands. The governmental projects in Jordan now are granting pieces of rural lands for reclaiming them, so that:
   a) I feel happy towards these projects for the benefit of present and future humans to meet their individual needs.
   b) I prefer these projects for increasing the local agricultural production.
   c) I commit of reclaiming the inappropriate lands for agriculture in order to become appropriate and to increase their production.
   d) It is difficult to contribute in these projects, because they are costly.

14. Desertification is considered one of the global and local problems, which
threaten the agricultural lands, so that:
   a) No necessity to plant the desert because of water evaporation.
   b) Planting the desert is bringing happiness to me.
   c) The contribution in planting desert is a good thing.
   d) Fighting desertification is a religious and political ethic.

15. The increasing of the Jordanian population is considered environmental problem, where the average of Jordanian family members is 5.3 according to the statistics of 2005. This growth affects on environmental balance, so:
   a) I feel sad when the number of my family members increases.
   b) I don’t prefer the increasing of my family members, and I ask into birth control in future.
   c) I commit of birth control, asking friends and relatives to do so.
   d) I prefer enlarging in the family members to increase the number of people.

16. How can you advise who are going to be married?
   a) Committing of medical checkup after marriage.
   b) Committing of medical checkup before marriage.
   c) They must not do any medical checkup so long as their health is good.
   d) Preferring making medical checkup before marriage.

17. From the goals of sustainable development, stimulating environmental awareness by the programs of environmental education, so that:
   a) I don’t ensure on linking between school curricula and environmental awareness.
   b) I feel happy when stimulating environmental awareness throughout school curricula.
   c) I prefer stimulating environmental awareness throughout environmental culturing.
   d) I commit of stimulating environmental awareness throughout the activities and programs of environmental education.

18. The nature is the God's gift to all livings and it has an instrumental and intrinsic values at the same time, so:
   a) The nature is protected and preserved for it’s instrumental values for humans and other creatures.
   b) The nature is protected and preserved for its intrinsic values.

19. It is very necessary to respect environmentalists and appreciate their works because of their good services for the humanity and environment, so that:
   a) I appreciate their roles in enhancing the environment for human only.
   b) I appreciate their roles in enhancing the environment for all creatures.
   c) I appreciate their roles in enhancing the environment for integrating the environmental systems.
   d) I appreciate their roles in protecting humans.
## APPENDIX C

### KEY ANSWERS FOR EVES LEVELS

<table>
<thead>
<tr>
<th>Questions</th>
<th>Commitment (4)</th>
<th>Preference (3)</th>
<th>Acceptance (2)</th>
<th>Before valuing (1)</th>
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<tr>
<td>Q1</td>
<td>d</td>
<td>c</td>
<td>b</td>
<td>a</td>
</tr>
<tr>
<td>Q2</td>
<td>c</td>
<td>b</td>
<td>d</td>
<td>a</td>
</tr>
</tbody>
</table>

| Q3 | c | b | a | d |
| Q4 | d | b | a | c |
| Q5 | c | b | a | d |
| Q6 | a | b | c | d |
| Q7 | c | b | a | d |
| Q8 | d | b | c | a |
| Q9 | a | c | b | d |
| Q10| c | a | b | d |
| Q11| c | b | a | d |
| Q12| c | b | a | d |
| Q13| c | b | a | d |
| Q14| d | c | b | a |
| Q15| c | b | a | d |
| Q16| b | d | a | c |
| Q17| d | c | b | a |
| Q18| b | d | a | c |
| Q19| c | b | a | d |
| Q20| d | c | a | b |