

**Attitudes and Behavior of Ajman University of Science and Technology  
Students Towards the Environment**

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### **Abstract**

This study examined the attitudes and behavior of Ajman University of Science and Technology (AUST) students towards the environment according to their gender and college. The research was based on a descriptive approach. The sample consisted of (375) students (230 males and 145 females) from different colleges (Law, Information Technology, Mass Communication and Humanities, Engineering, Dentistry and Pharmacy). The Attitudes and Behavior Scale Towards the Environment (ABSTE) was used to investigate students' attitudes and behavior Towards the environment, and a questionnaire was used to evaluate the environmental sciences course. Results revealed wide differences in the environmental attitudes and behaviors between the undergraduate students enrolled in environmental sciences course and others who did not study the course yet. Findings also showed that females have higher positive environmental attitudes and behaviors than males. Students of Dentistry and Pharmacy colleges have higher positive environmental attitudes and behaviors than students of Law and Information Technology or Mass Communication and Humanities colleges. Engineering students have the least positive environmental attitudes and behaviors. The results generally assert the importance of environmental education in university.

**Keywords:** environmental education; attitudes, behavior; university students

## **Introduction**

Environmental deterioration has emerged as a serious issue in the current world. The human factor is the largest contributor to the creation and exacerbation of many environmental problems that might advance into serious threats to humans and all living organisms (Gore, 1993). These environmental problems may increase greatly, mainly due to global negative activities or lack of environmental legislations in countries rather than individual activity. However, individuals with negative attitudes towards the environment will continue to pose problems regarding the environment (Uzun and Saglam, 2006). Individuals who have environmental literacy, awareness and sensibility might contribute to the solution of these environmental problems.

Environmental education has been viewed as an important approach to educate students about environmental issues, and to identify challenging environmental problems at all educational levels, including university (Fernández-Manzanal, Rodríguez-Barreiro, & Carrasquer, 2007; Tuncer, 2009). Therefore, environmental education is crucial to prepare environmentally literate graduates who will play an active role in protecting the environment by making informed decisions and engaging in environmental-friendly behaviors (UNESCO, 1980; Roth, 1992).

## **Literature Review**

### **Environmental Education**

The main aim of environmental education is to encourage citizens to act in an environmentally conscious manner that balances current social, economic, and environmental needs without compromising those of the future (Yorek, Ugudu, Salin, & Dogan, 2010); as well as to define and set goals at the cognitive, metacognitive, affective and behavioral levels (Sanera, 1998). Furthermore, environmental education aims to help people develop positive attitudes, emotions, thoughts or behaviors that increase their sensitivity towards the environment (Erten, Özdemir & Güler, 2003). Therefore, many studies put forward outcomes of environmental education that, given in different systems of education (formal and informal), enable people to: (a) develop positive changes in their attitudes and behaviors towards the environment (b) protect and sustain the environment. Thus, environmental education should be an essential part of education at all levels, including university (Grodzińska-Jurczak, Stepska, Katarzyna, & Bryda, 2006; Palmberg and Kuru, 2000).

### **Attitudes and Behavior**

It is assumed in social psychology that an individual's personal evaluations are more informative of the person's attitude than what she/he claims to do (Eagly and Chaiken, 1993). Atkinson has defined attitudes as "favorable or unfavorable evaluations of/and reactions to objects, people, situations, or any other aspects of the world." They help us to predict and change people's behavior (Atkinson et al., 1996). To be precise, attitude can also be considered as an "overall evaluation that expresses how much we like or dislike an object, issue, person or action" (Hoyer & MacInnis, 2001, p. 128). Schultz and Zelezny (2000) pointed out that the attitude of environmental concern originates from the individual's concept of himself and from the degree of self-perception as a fundamental part of the natural environment. It is believed that behavior is what people do, whether it is appropriate for the environment or not (Hernandez & Monroe, 2000). In general, behavior is supported by knowledge and attitude, but the direct

connections between knowledge to attitude and to behavior do not always exist (Hernandez & Monroe, 2000).

Many studies confirmed that knowledge itself is not enough to change individuals' attitudes or even to motivate them to adopt a new behavior (Stern, 2000; Schultz, 2002), although the lack of knowledge may represent an obstacle for behavioral changes (DeYoung, 2000; Schultz, 2002). That means knowledge is not the only thing that affects individual environmental awareness, but there is also a combination of awareness, attitudes and values; social, cultural and psychological. Newhouse (1990) confirmed also that the lack of knowledge about a certain aspect of life may be considered as a barrier for attitude change. Only attitudes, which are a derived from life experiences and education, can affect behavior. (Oweini and Hourri, 2006).

### **Environmental Attitude, Environmental Behavior and Environmental Education**

The educational and ecological literature contains various approaches in defining environmental attitudes. These approaches consist of attitudes, psychosocial variables, personal responsibility, and locus of control (Hines, Hungerford & Tomera, 1986). Attitudes have been expressed as common feelings towards the environment, being concerned about specific environmental issues, and taking action to reform environmental problems. While personal responsibility expresses the individual's feeling of obligation toward the environment, locus of control stands for the individual's understanding of their ability to bring about environmental change through personal behavior (Peer et al., 2007). Therefore, the individual characteristics that change according to external factors will have little to no effect on the situation. Those that change according to internal factors will have a strong effect on the situation.

Internal locus of control describes people who believe in their ability to bring about change through personal procedures (Peyton & Miller 1980; Hungerford & Volk 1990). One of the critical goals in establishing environmental literacy is to support people in believing in their ability to contribute in solving environmental problems through personal behavior, either as individuals or as a part of a group (Peer, Goldman & Yavitz, 2007; Mondéjar-Jiménez, 2012). Consequently, environmental behavior can be defined as the action of an individual or group that promotes the sustainable use of natural resources (Sivek and Hungerford, 1989). Thus, students' attitudes affect their behavior, especially their choice of action and their decisions. For instance in schools, students who have high scientific knowledge tend to choose more appropriate decisions (Ugulu, Sahin, & Baslar, 2013). This means there is a direct relationship between environmental education and environmentally responsible attitudes and behaviors (Vlaardingerbroek and Taylor 2007).

Certain previous studies pointed out the correlation between cognitive and affective attributes is weak and non-linear (Myers, Boyes, & Stanisstreet, 2004). They also suggested that knowledge is not enough to change attitudes and adopt responsible behavior. On the other hand, many researchers found significant effects of environmental education on students' attitudes. (Bradley & Walickzek, 1999; Pooley & O'Connor, 2000; Sama, 2003; Maki, Abddel-Khalick, & Boujaoude, 2003; Yılmaz, Boone, & Anderson, 2004; Alp, 2005; Koses, Gezer, Eroll, & Bilen, 2006; Uzun & Saglam, 2006; Fernández-Manzanal, et al., 2007; Aslan & Cansaran, 2008; Ozsoy, 2012). Some research indicates that attitudes can be a predictor of environmental behavior (Bamberg & Moser, 2000; Chewla, 2006; Sivek, 1988).

Various researchers found significant differences between male and female attitudes towards environmental problems and behavior towards the environment. Females had higher pro-environmental attitudes than males (Kuitunen & Tynys, 2000; Talay, Gunduz, & Akpınar,

2003; Sherkat and Ellison, 2007; Fernández-Manzanal et al., 2007; Torgler, García-Valiñas, & Macintyre, 2008; Ek, et al., 2009; Kose et al., 2011; Ozsoy, 2012).

## **Methodology**

### **Purpose of the Study**

Understanding and consciousness about environmental issues seem to be of particular importance in examining university students' attitudes and behaviors towards the environment, given the importance of a strong positive attitude towards the environment related to environmental behavior. Therefore, the purpose of this study is to explore undergraduate students' attitudes and behaviors toward the environment. The research questions to be addressed in this study are as follows:

1. What are undergraduate students' attitudes and behaviors towards the environment in Ajman University?
2. Are there any differences among undergraduate students' attitudes and behaviors in Ajman University towards the environment regarding their gender?
3. Are there any differences among undergraduate students' attitudes and behaviors in Ajman University towards the environment regarding their colleges?
4. Are there any differences between attitudes and behavior of undergraduate students enrolled in environmental sciences course and others who did not yet study environmental sciences course?
5. What are the students' evaluation of the course materials and their suggestions to improve it?

### **Importance of the Study**

Ajman University of Science and Technology (AUST) has integrated an environmental sciences course as a required course. This study is important because it investigated factors that affect students to adopt positive attitudes and responsible behaviors towards their environment. Additionally, this study may help in developing course material and activities, as well as provide suggestions to protect the environment and explore solutions to environmental problems.

## **Methods**

### **Participants**

The sample was taken from undergraduate students enrolled in environmental sciences classes in the first semester for the academic year of 2014/2015 (Table 1). It consisted of (375) students; 230 females (61.3%) and 145 males (38.7%). The sample included students with literacy or science backgrounds. The students with a literacy background were 180 students (49.4%) from Law, Information Technology, Mass Communication and Humanities colleges. The students with a science background were 140 students (37.3%) from Engineering and 50 students (13.3%) from Dentistry and Pharmacy. All participants attended Ajman University in UAE, Participants were volunteers in this study.

Table 1. Profile of participants

College	Female	Male	Total	Ratio %
Law & Information, Mass communication and Humanities	110	75	185	49.4%
Engineering	90	50	140	37.3%
Dentistry& pharmacy	30	20	50	13.3%
Total	230	145	375	
Ratio	61.3%	38.7 %	100%	

### Instruments

**The Attitudes and Behavior Scale Towards the Environment (ABSTE).** ABSTE was designed to determine students' attitudes and behavior towards the environment. The scale consists of (30) items put in two groups on a 5-point Likert scale that ranged from 1 (strongly agree) to 5 (strongly disagree). The two main factors of the scale were (a) Students' Attitudes towards the Environment (SATE). (15 items) (b) Students' Responsible Behavior towards the Environment (SRBTE). (15 items).

**Environmental sciences course evaluation questionnaire.** This questionnaire was designed to evaluate students' opinions towards the environmental sciences course, it consisted of 10 items with a 5 point Likert scale, that ranged from 1 (strongly agree) to 5 (strongly disagree), and one open question about their suggestions to improve the environmental sciences course.

**Validation and Reliability of ABSTE.** ABSTE was designed and tested for validity and reliability.

**Validity.** The attitudes and behavior scale towards the environment originally consisted of 38 items. It was subjected to content validity by submitting it to experts in psychology and experts in measurement and evaluation for their input and necessary corrections. According to their comments some items were deleted and some items have been modified, therefore the instrument ultimately included 30 items.

Internal consistency validity was determined by applying ABSTE to another sample consisting of 40 students and calculating Pearson r between every item of the scale and the total score of the scale, the correlation coefficients ranged between 0.59 and 0.77. Pearson r was calculated between every item and the total of its factor. The correlation coefficients ranged between 0.67 and 0.89. All correlation coefficients were significant, which confirmed the validity of the scale.

**Reliability.** The ABSTE was subjected to Cronbach's alpha reliability measure in the present study. Student's attitudes towards the environment (SATE) were 0.77, Student's responsible behavior towards the environment (SRBTE) was 0.75, and the total of (ABSTE) was 0.78. These are satisfactory reliability coefficients.

## Results

Table 2. Mean, Standard Deviation and Relative Weight for ABSTE

	Highest points	mean	SD	RW	order
<b>Factor 1</b>	75	55.8	6.94	77.39	1
<b>Factor 2</b>	75	49.65	8.15	66.34	2
<b>Total scale</b>	150	105.6	11.37	71.87	

Table 3. Means, Standard Deviations and Relative Weight of the Sample Respondents' scores of ABSTE

N	ITEM	Mean	SD	Rel. Weight	Desc. Order
	<b>-Factor (1): Student's Attitudes towards the environment (SATE).</b>				
5	Awareness of environmental problems contributes to countries' development.	4.42	0.75	88.49	1
3	Environmental problems have to be discussed in all the countries.	4.40	0.70	88.00	2
13	Media must have role in spreading environmental awareness.	4.29	0.69	85.85	3
1	I concerned about problems affecting the current environment in the world	4.21	0.67	84.29	4
2	There are a little to be done about current environmental problems	3.98	0.71	79.61	5
14	I think that is essential to raise the awareness about the dangerous of environmental problem among all citizens	3.90	0.69	79.10	6
15	I think the recycling bins around the country are valuable.	3.87	0.88	77.46	7
12	I appreciate the efforts made to preserve and protect the environment	3.85	0.99	77.20	8
7	Environmental problems in the UAE is not critical	3.80	0.94	76.00	9
8	Seminars and workshops regarding development of environmental awareness are useful	3.50	1.06	75.33	10
6	It's useless to warn people about environmental problems	3.34	1.07	73.24	11
9	I enjoy reading books and magazines on environmental issues	3.12	1.06	72.10	12
10	Knowledge about environmental problems in not my specialty.	3.10	1.01	69.91	13

4	The so-called ecological crisis facing humankind has been greatly exaggerated	2.99	1.14	68.10	14
11	I am bored by news related to environmental issues	2.97	1.10	66.23	15
	<b>Total score of factor (1)</b>	<b>3.72</b>	<b>1.65</b>	<b>77.39</b>	
	<b>- Factor (2): Student's Responsible Behavior towards the environment (SRBE)</b>				
1	For saving energy, I turn off the light in my house when it is not used.	4.43	0.65	88.78	1
2	I willingly join activities to help save the environment.	4.36	0.70	88.00	2
6	I don't consume long time while I'm showering	4.21	0.79	86.24	3
7	I don't waste much water while I'm brushing my teeth	4.17	0.79	84.78	4
15	I've always reused the white paper in old notebook.	3.59	0.86	77.86	5
11	I always put any old stuff (clothes, shoes...etc.) in recycling bins.	3.55	0.89	73.11	6
8	I buy only as much as needed while I'm shopping	3.41	1.03	71.02	7
5	I always watch T.V program about environmental problems.	3.38	0.91	68.50	8
4	I always talk with people around me about environmental matters.	3.34	0.96	67.57	9
13	I share links relevant environment and environmental awareness on social networks (Facebook / Twitter, Linked in,...)	3.01	1.12	66.72	10
3	I avoid buying products in aerosol containers	2.91	1.14	52.39	11
14	I read labels on products to see if the contents are environmentally safe	2.40	1.03	47.34	12
10	I feel happy when I see people recycle used bottles, cans and papers	2.39	1.00	43.56	13
12	My friends know me as sensible person towards environment	2.30	1.34	40.25	14
9	I prefer using environmental harmless products	2.24	1.42	38.93	15
	<b>Total score of factor (2)</b>	<b>3.31</b>	<b>1.74</b>	<b>66.34</b>	
	<b>Total of the scale</b>	<b>3.52</b>	<b>1.15</b>	<b>71.87</b>	

To answer the questions and investigate the attitudes and behavior of undergraduate students enrolled in the environmental sciences course towards the environment, we considered a rank of 3.0 as the midpoint, which meant the item indicated positive if scored 3.0 or above.

As seen in Table 2, the undergraduate students indicated somewhat positive attitudes and behaviors toward the environment in the total scale; the total mean of the scale was 3.52 with SD 1.15 and RW 71.87. For factor 1 students' attitudes towards the environment total mean



was 3.72 with SD 1.65 RW 77.39. For factor 2, Students' Environmentally Responsible Behavior (SERB), the total mean of the scale was 3.31 with SD 1.75 and RW 66.34.

### Factor 1: Student's Attitudes towards the Environment

As seen in Table 3, students scored the three relatively highest in the following items: five,  $M = 4.42$ , which was "Awareness of environmental problems contributing to countries' development" then item three,  $M = 4.40$ , which was "Environmental problems have to be discussed in all the countries" then item thirteen,  $M = 4.29$ , which was "Media must have a role in spreading environmental awareness." In these items, students showed their understanding about the importance of environmental awareness and its effect on countries' development and how as a result, students thought it essential to discuss environmental problems among all countries together, not separately. They understood very well the important role of media in spreading awareness about the environment. The lowest item was item four,  $M = 2.96$ , which was "I am bored by news related to environmental issues."

### Factor 2: Student's Responsible Behavior towards the Environment

We can see that students scored the following three items relatively higher in item one,  $M = 4.43$ , "For saving energy, I turn off the light in my house when it is not used", then item two,  $M = 4.36$ , "I willingly join activities to help in saving the environment" then item six,  $M = 4.2$  "I don't consume long time while I'm showering." In these items students translate their environmental awareness to many practical reactions and responsible environmental behaviors for saving environmental resources like water and energy. The lowest item was item nine, "I prefer using environmental harmless products"  $M = 2.24$ .

Table 5: Descriptive statistics of the sample

		<b>N</b>	<b>M</b>	<b>SD</b>
<b>Gender</b>	Female	230	83.95	18.20
	Male	145	49.57	14.25
<b>College type</b>	Law, Information Technology, Mass Communication and Humanities	185	73.12	23.18
	Engineering	140	54.05	18.01
	Dentistry and Pharmacy	50	83.39	8.98

In order to investigate if there were any difference in students' attitudes and behaviors towards the environment according to their gender or college, a two-way Analysis of Variance (ANOVA) was conducted on the ABTES.

Table 6: Results of two-way ANOVA on the ABTE scale

Source	Df	Means square	F	P
Gender	1	26469.112	147.208	0.000
college type	2	9205.579	50.835	0.000
College* gender	2	9967.041	56.412	0.000
Error	370			
Corrected total	373			

According to Table 6 there is a significant mean difference between females and males in their attitudes and behaviors toward the environment. It was found that females have higher positive attitudes and behaviors towards the environment than males. Additionally, regarding the main effect of students' college, a statistically significant mean difference was found among Law and Information Technology, Mass Communication and Humanities colleges, compared to Dentistry and Pharmacy and Engineering colleges on the AFTE scale,  $F = 50.835$ ,  $p = 0.000$ .

The Scheffé post hoc tests were conducted to determine the mean score differences between groups. The comparison of mean scores according to the college type indicates that Dentistry and Pharmacy students expressed more positive attitudes and behaviors toward the environment than both Law and Information Technology, Mass Communication and Humanities colleges and the Engineering College. However, Law and Information Technology, Mass Communication and Humanities students showed more positive attitudes and behaviors than engineering students. The results also show that females in Law and Information Technology, Mass Communication and Humanities have the highest score in the ABSTE than other colleges, while males in Dentistry and Pharmacy have highest score in the ABSTE.

In order to investigate if there are any differences in attitudes and behaviors towards the environment between undergraduate students enrolled in the environmental sciences course and others who did not study the course yet, a group of 120 students (32%) has been taken from the main sample (375), and another group with 120 students (32%) who did not yet study the environmental course was taken randomly. A t-test was determined for independent samples for the two groups.

Table 7. Difference between students enrolled in the environmental course and others who are not studying the course yet

	N	M	SD	Df	T	P
Group 1	120	113.7	6.78	238	28.12	0.001
Group 2	120	84.3	9.23			

As shown in Table 7 there is a significant mean difference in the attitudes and behaviors towards the environment between Group 1 (undergraduate students enrolled in the environmental sciences course) and Group 2 (students who did not study the course yet) in their attitudes and behaviors towards the environment for Group 1,  $t(238) = 28.12$ ,  $p = 0.001$ .

## Student Evaluations of the Environmental Course

In order to investigate the students' evaluation of the course materials and their suggestions to improve the course, the environmental sciences course evaluation questionnaire was applied. As shown in Table 8 students indicated somewhat positive attitudes towards the environmental course. The total mean was  $M = 3.27$  with  $SD = 2.09$  and  $RW = 73.06$ . Regarding the open question about students' suggestions to improve the course, they proposed many suggestions:

1. Environmental sciences classes should not exceed 30-40 students. That gives students chances to be more involved in class activities (discussion, presentation, projects).
2. Environmental sciences course material should be updated and focused on some current critical environmental problems that affect humankind like climate change and nuclear problems and should mention some practical solutions that students can do to share in saving the environment.
3. Environmental course materials contained much information, so they should be divided into two parts: information to know and information for the exam.
4. Environmental course materials should be presented in an interesting way with more practical and interactive work.
5. Environmental sciences courses must have practical activities to make students more involved in environmental issues such as:
  - Trips to (planetarium, Masdar city, desalination factories, groundwater wells, solar power plants)
  - Visits to organizations working in the environmental field (Abu Dhabi Authority for Environment, Ministry of Environment, etc.)
  - Invite organizations working in environmental industries to hold some activities in Ajman University such as workshops, seminars, training, lectures and competitions to make students more caring and aware of their environment.

Table 8. Mean, standard deviations and relative weight of respondents' scores on the environmental sciences course evaluation questionnaire

N	Item	M	SD	RW	order
1	Environmental sciences course is somewhat difficult.	3.56	1.72	73.21	5
2	If the environmental courses was not required course, I think will choose it to study.	2.61	1.46	66.11	8
3	Environmental sciences course is an important course for students in science major (medicine - pharmacy .....)	2.43	0.99	65.53	9
4	Environmental sciences course provide very important information about environmental issues.	3.93	0.98	85.46	1
5	Environmental sciences course is only necessary for passing examination.	2.41	1.33	64.38	10
6	After studying environmental sciences course ,I feel responsibility towards the environment	3.82	1.31	79.45	3
7	Environmental sciences course made me think to find solutions for environmental problems	3.78	1.47	75.17	4
8	The course content successfully covered all environmental issues in very simple way.	2.98	1.12	68.62	7
9	Environmental sciences course need more practical activities	3.87	1.03	83.22	2
10	Feeling satisfied of studying Environmental sciences course	3.33	0.89	69.44	6
		3.27	2.09	73.06	

### Discussion

According to the descriptive results of this study, it has been observed that there were significant differences in the environmental attitudes and environmental behaviors between the undergraduate students enrolled in the environmental sciences course and undergraduate students that did not study the course. The students enrolled in the environmental sciences course indicated positive environmental attitudes and environmental behavior. However, the total scale score and item scores were clustered just above the mid-point.

These findings support previous studies which observed that students who had environmental education were more aware of environmental attitudes than other students (Bradley et al., 1999; Thapa, 1999; Pooley & O'Connor, 2000; Talay et al., 2003; Sama, 2003; Maki et al., 2003; Yılmaz, et al., 2004; Alp, 2005; Erol & Gezer, 2006; Uzun & Saglam, 2006; Fernández-Manzanal et al., 2007; Aslan & Cansaran, 2008; Ozsoy, 2012). The results also agree with other studies that found significant effects of environmental education on students' environmental behaviors (Bamberg & Moser, 2000; Chewla, 2006; Sivek , 1988). Otherwise, it disagrees with some previous studies that found environmental education does not affect students' environmental attitudes and environmental behavior (Kahraman, Yalcın, Ozkan, & Aggul, 2008; Ozdemir, Yıldız, Ocaktan, & Sarısen, 2004; Müderrisođlu & Altanlar, 2011).

Concerning factor one of the scale related to students' attitudes towards the environment, the items that scored the three relatively highest were: "Awareness of environmental problems contributes to countries' development," "Environmental problems have to be discussed in all the countries," and "Media must have role in spreading environmental awareness." These three items reflect the students' consciousness and understanding, the importance of environmental awareness and its effect on countries' development, and how the ecological crisis is threatening humankind through environmental problems. The results show how the students understand the role of media in spreading environmental awareness. They are keen to know and care about the environment which indicates students' positive attitudes towards the environment. The lowest item was "I am bored by news related to environmental issues." The students did not seem to mind reading news about the environment.

Concerning factor two of the scale related to students' responsible behavior towards the environment, students scoring the three relatively highest were: "For saving energy, I turn off the light in my house when it is not used," "I willingly join activities to help in saving the environment," "I don't consume long time while I'm showering." In these items students translate their environmental awareness and environmental attitudes in many practical reactions like saving environmental recourses (water and energy). This asserts the positive effect of environmental awareness and attitudes on responsible behavior towards the environment. The lowest item was, "I prefer using environmentally harmless products." This finding might be logical because the harmless product is somewhat expensive for them as they are still students.

Overall, it is clear that students have background knowledge about the environment, which is translated to their attitudes and behaviors towards the environment. Although there are many factors that could affect their attitudes and behaviors, environmental education could be one of the most important factors that affect their attitudes and behaviors towards the environment. The significant difference between students enrolled in the environmental sciences course and others who did not study it yet, confirmed the importance of environmental education that is reflected in students' environmental attitudes and behaviors. Therefore, it is a good sign that Ajman University of Science and Technology (AUST) has integrated an environmental sciences course as a required course.

As Ozmen et al., (2005) and Ek et al. (2009) showed, an environmental course should be included in university education as well as primary and secondary education. For future implications, the content and delivery of the environmental course might be restructured to obtain more interests of university students from a wide range colleges and different backgrounds in handling environmental issues and improving their environmental attitudes and behaviors.

The two way ANOVA results revealed significant differences in the perceptions of male and female students' attitudes and behaviors towards the environment. Female students expressed more positive attitudes and behaviors towards the environment than males. This finding is consistent with many other studies (Kuitunen and Tynys, 2000; Talay et al, 2003; Sherkat and Ellison, 2007; Fernández-Manzanal et al., 2007; Torgler et al., 2008; Ek & Kılıç et al., 2009; Kose et al., 2011; Ozsoy, 2012). As Jenkins and Pell (2006) found, females show a high degree of social responsibility and make a significant contribution to environmental protection.

These findings indicated that there are differences among the mean scores of students based on their colleges on the Attitude and Behavior Scale towards the Environment. The comparison of mean scores according to their colleges indicated that male students from Dentistry and Pharmacy colleges displayed more positive attitudes and behaviors towards environment than

Law and Information Technology, Mass Communication and Humanities and Engineering colleges. On the other hand female students from Law and Information Technology, Mass Communication and Humanities expressed more positive attitudes and behavior towards the environment than Dentistry and Pharmacy and Engineering colleges. Differences among colleges may reflect that some students may have learned or read about the environment for the first time. Consequently, they might be more interested in environmental issues which are reflected in their positive attitudes than students who had previously taken course work on environmental studies.

Findings regarding the evaluation of the environmental course showed positive attitudes towards course materials, which was clear in the choices for the three highest items: “Environmental sciences course provides very important information about environmental issues,” “Environmental sciences course needs more practical activities” and “After studying the environmental sciences course, I feel responsibility towards the environment.” These items reflected students’ understanding of the importance of environmental sciences information in their life. The results also showed their interaction with course material that made them think and decide that the course needed more practical activities. In addition the students considered that the course information had a positive impact on them because it made them feel responsible towards the environment. Also students were very keen to share positive suggestions to improve the course.

### **Conclusion**

Environmental problems have emerged as a serious issue in the world today and educating people is the main way to reduce environmental problems by raising awareness and responsiveness towards the environment. Environmental education has an effective impact on students’ environmental attitudes and behaviors. It is an essential way to reduce environmental problems that are due to lack of environmental legislation all over the globe. Education is a long-life process, so it is crucial to teach about the environment at all educational stages beginning from pre-school and continuing to university education. University students of the present will be the leaders of the future. Some of them may be engineers in large factories or administrative staff in private and public places in the future, or as direct policy makers who can apply pressure for diminishing environmental problems. Therefore, universities should offer an environmental education program covering environmental sciences for all programs and colleges in order to improve the awareness and consciousness of students towards environment.

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## Appendix A

### Attitudes and Behavior Scale towards the Environment (ABSTE)

Dear Students,

This questionnaire discusses some items about the environment and our relation with it. It consists of 30 items. Write your personal information, then read carefully every item and choose only one option out of five (strongly agree- agree-not sure-disagree-strongly disagree). We ensure you full confidentially and will only use for scientific research purpose.

Name : ..... Gender : .....  
 College : ..... Midterm mark : .....  
 Class : ..... Age : .....

	ITEM	Strongly agree	agree	Not sure	disagree	Strongly disagreed
1	I concerned about problems affecting the current environment in the world					
2	For saving energy, I turn off the light in my house when it is not used.					
3	There are a little to be done about current environmental problems.					
4	Environmental problems have to be discussed in all the countries.					
5	I willingly join activities to help save the environment.					
6	I avoid buying products in aerosol containers					
7	The so-called ecological crisis facing humankind has been greatly exaggerated					
8	I always talk with people around me about environmental matters.					
9	Awareness of environmental problems contributes to countries' development.					
10	I always watch T.V program about environmental problems.					
11	I don't consume long time while I'm showering					
12	I don't waste much water while I'm brushing my teeth					
13	It's useless to warn people about environmental problems					
14	I think the recycling bins around the country are valuable.					
15	Environmental problems in the UAE is not critical.					
16	I buy only as much as needed while I'm shopping					
17	Seminars and workshops regarding development of environmental awareness are useful					
18	I enjoy reading books and magazines on environmental issues					

19	I prefer using environmental harmless products					
20	Knowledge about environmental problems in not my specialty.					
21	I feel happy when I see people recycle used bottles, cans and papers.					
22	I am bored by news related to environmental issues					
23	I appreciate the efforts made to preserve and protect the environment					
24	Media mast have role in spreading environmental awareness.					
25	I always put any old staff (clothes, shoes...etc.) in recycling bins.					
26	My friends know me as sensible person towards environment					
27	I share links relevant environment and environmental awareness on social networks (Facebook / twitter ,...)					
28	I read labels on products to see if the contents are environmentally safe					
29	I think that is essential to raise the awareness about the dangerous of environmental problem among all citizens					
30	I've always reused the white paper in old notebook.					

**Thank you for your cooperation**

